

U. S. DEPARTMENT OF THE INTERIOR
PROTOTYPE OIL SHALE LEASING PROGRAM

TN
859
.C64
C3755
no. 3
v. 7

TRACT C-b

QUARTERLY REPORT #3

(Through May 31, 1975)

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Submitted to:

Mr. Peter A. Rutledge
Area Oil Shale Supervisor
Conservation District
U. S. Geological Survey
Grand Junction, Colorado

By:

Ashland Oil, Inc.
Atlantic Richfield Company
Shell Oil Company, Operator
The Oil Shale Corporation

JULY 15, 1975

U. S. DEPARTMENT OF THE INTERIOR

NATIVE ORIGINATING PROGRAM

NEW LEASING
D-653A, Building 50
Denver Federal Center
P. O. Box 35067
Denver, CO 80235-0067

Mr. [Name]
Supervisor
Geological Survey
Colorado

By: [Name]
[Title]
[Company]
[Address]
[City, State, Zip]

JULY 1975

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V. OTHER STUDIES

1. Fish and Wildlife Management Plans
2. Resource Studies
3. Microbial Environmental Studies
4. Aerial Photography Studies
5. Archaeological Studies
6. Seismic Vibration Studies

Schlumberger**CEMENT BOND LOG**

GR-VDL-CCL

COUNTY RIO BLANCO
Field or LOCATION
WELL SG-NO. 6
COMPANY ATLANTIC RICHEFIELD COMPANY

COMPANY ATLANTIC RICHEFIELD COMPANYWELL SG NO. 6

FIELD _____

COUNTY RIO BLANCO STATE COLORADOLOCATION 2523' FSL & 2251' FWL

API Serial No. _____

Other Services: _____

Sec. 7 Twp. 3S Rge. 96W

Permanent Datum: GROUND LEVEL, Elev. 6888
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6888

Date	9-13-74		Type Drill Fluid	WATER		
Run No.	ONE		Fluid Level	FULL		
Depth — Driller	2220-1474		Max. Rec. Temp.	---- °F		
Depth — Logger	1458-1475		Est. Cement Top	1132		
Btm. Log Interval	1432-1467		Equip. Location	3862	VERNAL	
Top Log Interval	982- 892		Recorded By	ST. AUBYN		
Open Hole Size	7 7/8		Witnessed By	MR. ROSS		
CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String	8 5/8			T & C	SURF	59
Prot. String	2 3/8	4.7		T & C	SURF	2210
Prod. String	2 3/8	4.7		T & C	SURF	1466
Liner	2 3/8	4.7		T & C	SURF	1194

PRIMARY CEMENTING DATA

STRING	Surface	Protection	Production	Liner
Vol. of cement			210 SKS	
Type of cement			HOWCO LT. WT.	
Additive			10#/SK GILSONITE	
Retarder				
Wt. of slurry				
Water loss				
Type fluid in csg.				
Fluid wt.				

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THE WELL IDENTITY, LOCATION AND BUREAU REFERENCE DATA WERE TURNED BY THE CUSTOMER.

PRIMARY CEMENTING PROCEDURE

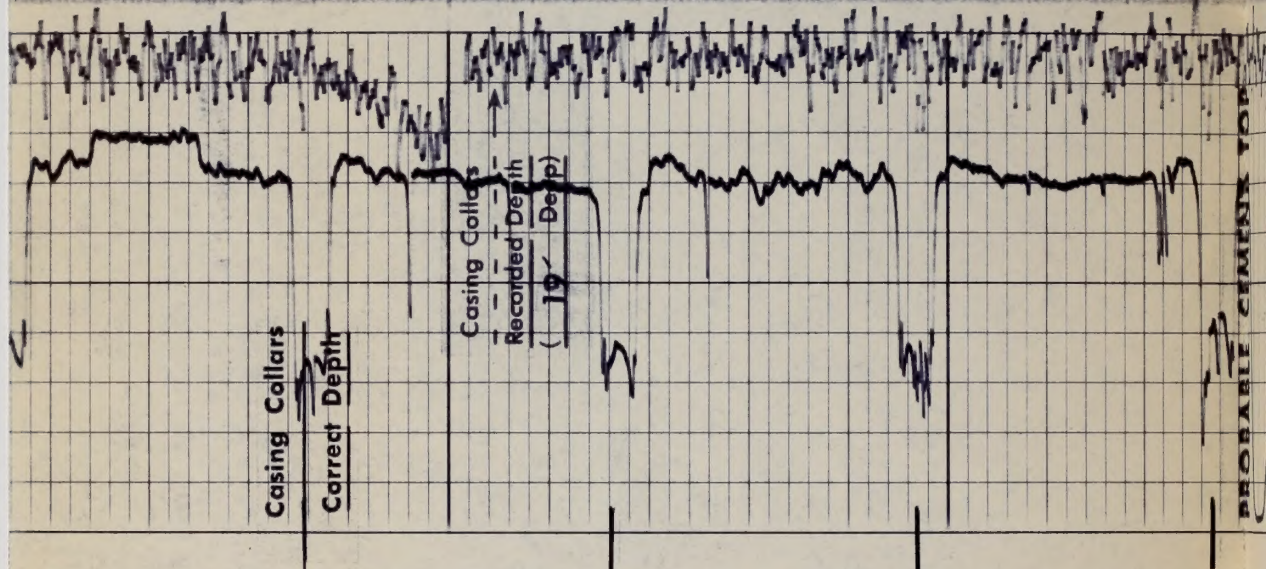
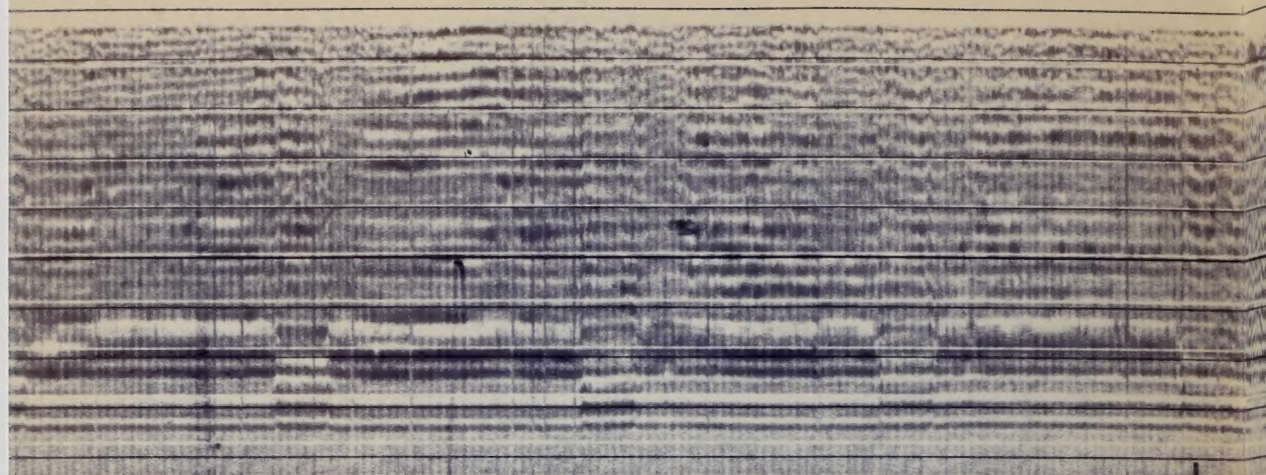
	Hour - date	Hours from start of operation	REMARKS
Started pumping cement	08:30 8-27-74		Service Order No. 49323
Release pressure	09:30 8-27-74		Csg. Collars Recorded 19 ft. DEEP
Start Cement Bond Log	10:00 9-13-74		
Finish Cement Bond Log	16:00 9-13-74		
Preceding fluid	Volume _____ bbls.	Pipe reciprocated during Pumping: Yes _____ No _____	
Cement pumped	_____ bbls./minute	Pipe reciprocated after plug down: Yes _____ min., No _____	

SQUEEZE JOB DETAIL

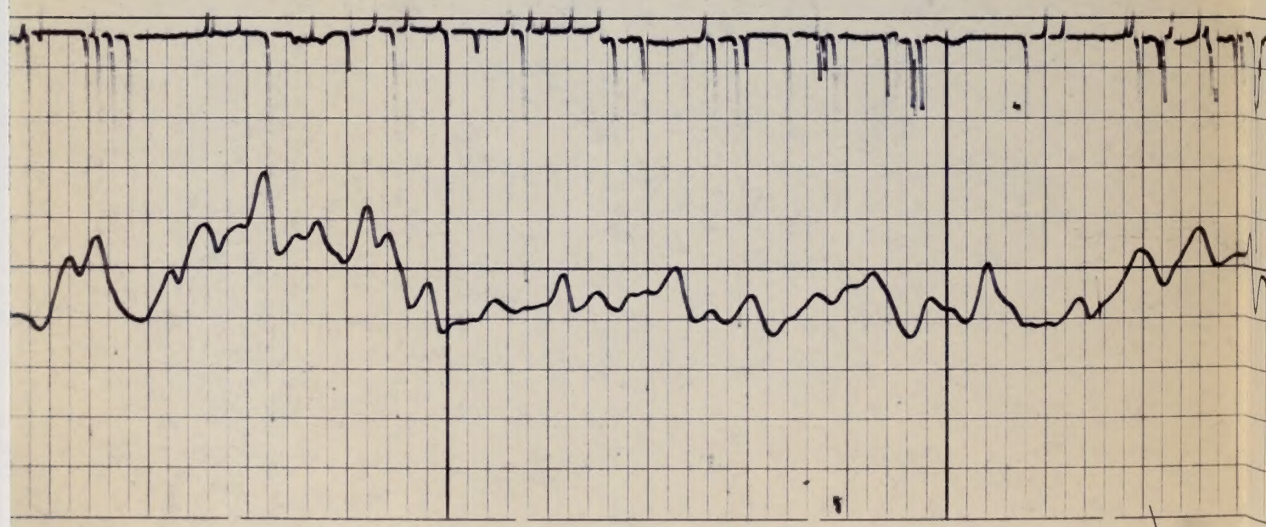
SQUEEZE JOB DETAIL		EQUIPMENT DATA	Centralizer Depths	Scratcher Depths
Squeeze number	1	Sonic Panel No.	SLP-FH#639	
Date	2	Sonic Cart No.	SHH-AHA#45	
Depth interval		Sonic Sonde No.	SLT-JC#54	
Type cement		CRP No.	14	
Volume of cement		Mem Panel No.	MMP-B#201	
Additive		GR Panel No.	GNP-D#556	
Retarder		GR Cart No.	SHH-AFA#91	
Weight of slurry		Centralizer: Type	CME-V CAL-AJ	
Preceding fluid		No.	CMEW	
Breakdown pressure		To Level (MV)	100	
Max. pressure-stage 1		Cart. Gain	1/20	
" " " 2		CRP Intensity	.16	
" " " 3		R9G Intensity	7 1/2	
Final maximum pressure		Logging Speed	30 FPM	
Started pumping cement		Time Constant		
Released pressure				
Start CBL				
Finish CBL				
AVERAGE WELL DRIFT:	° from _____ to _____			

Remarks: THE WELL IDENTITY, LOCATION AND BUREAU REFERENCE DATA WERE TURNED BY THE CUSTOMER.

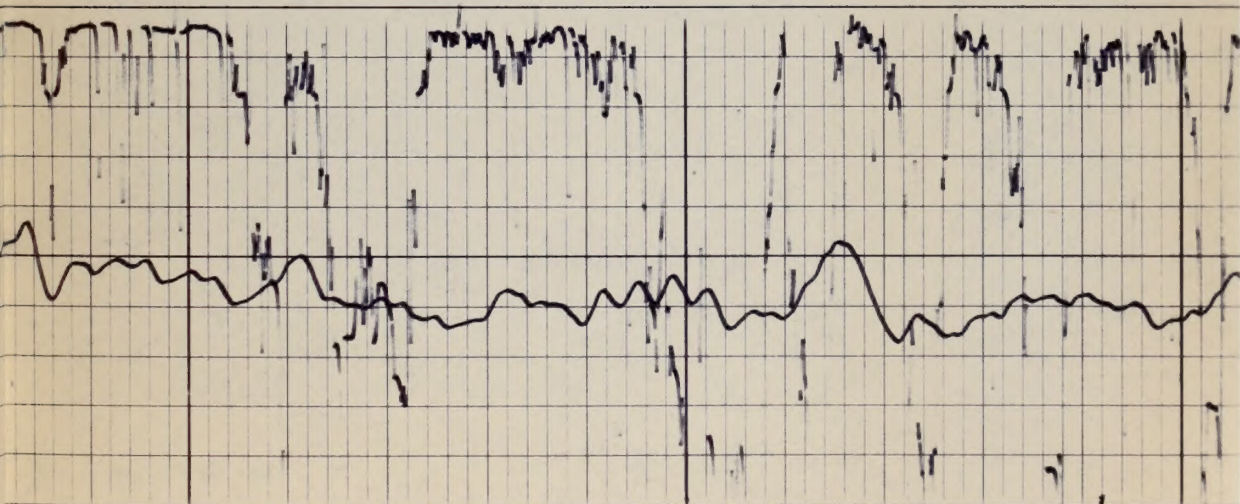
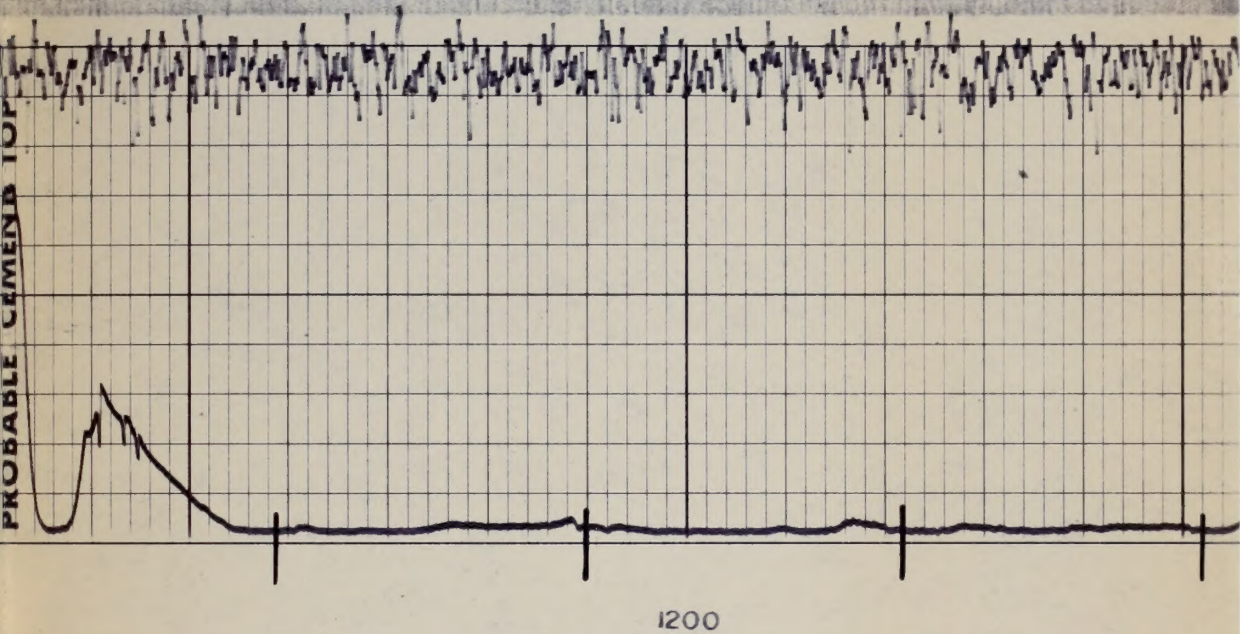
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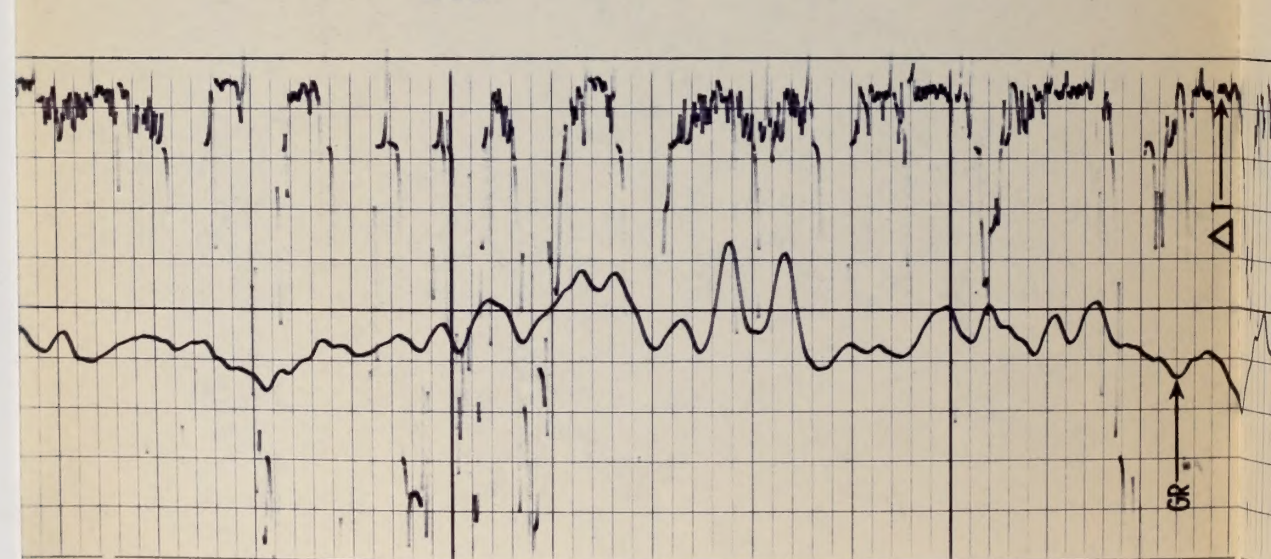
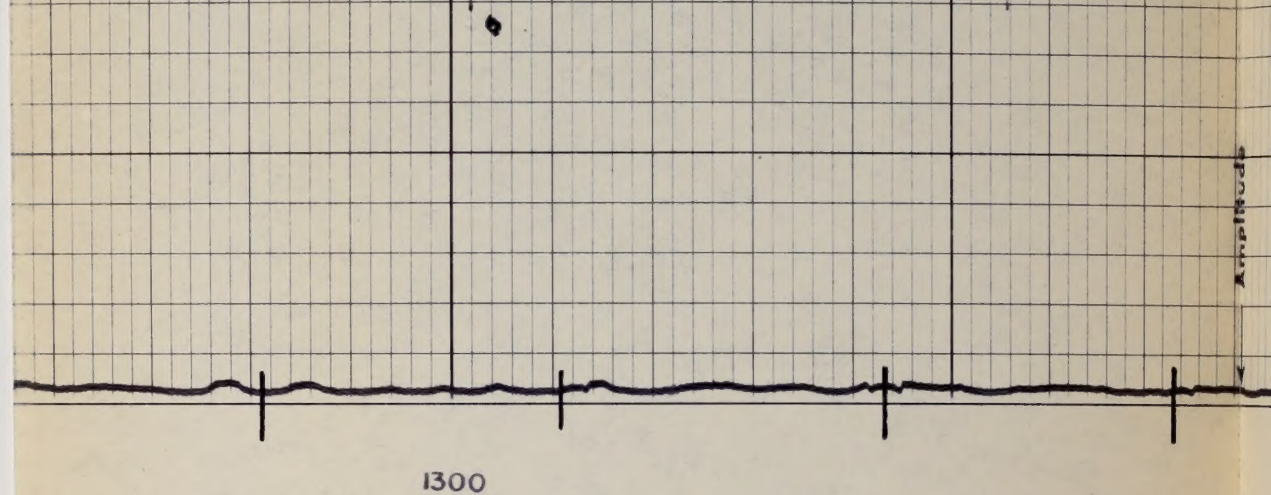
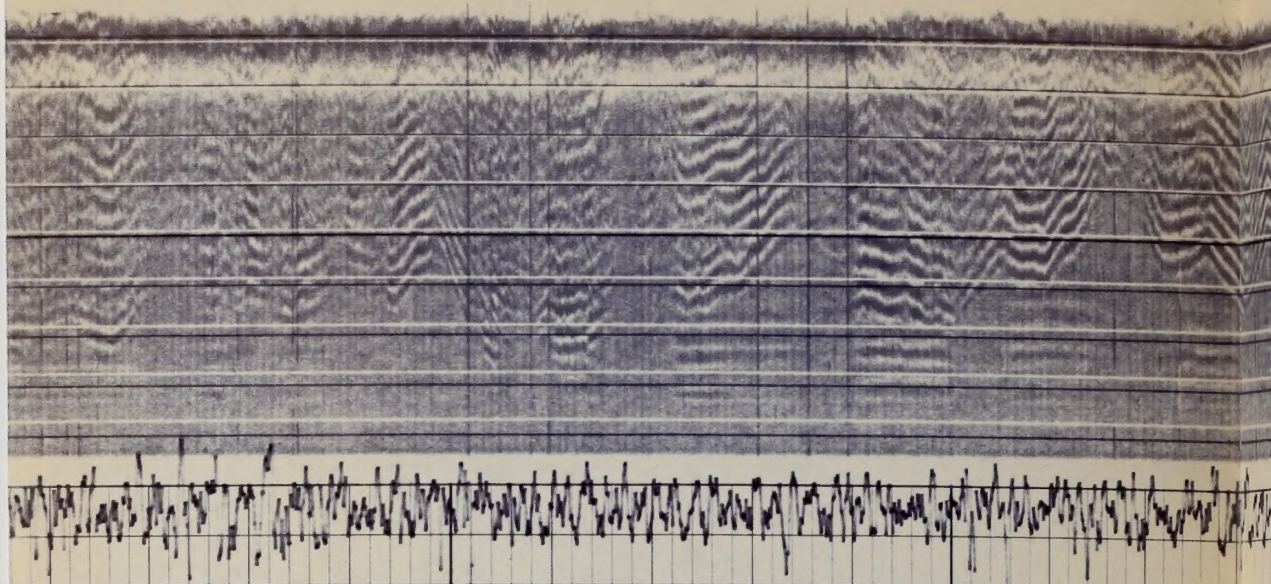


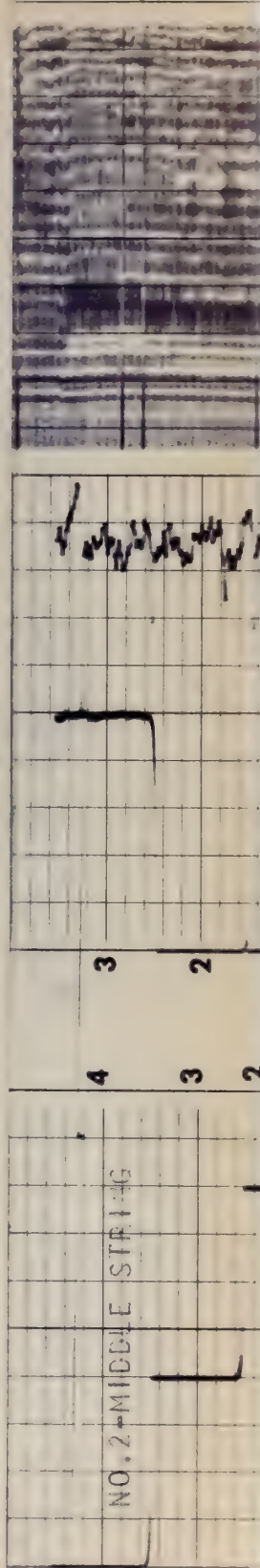
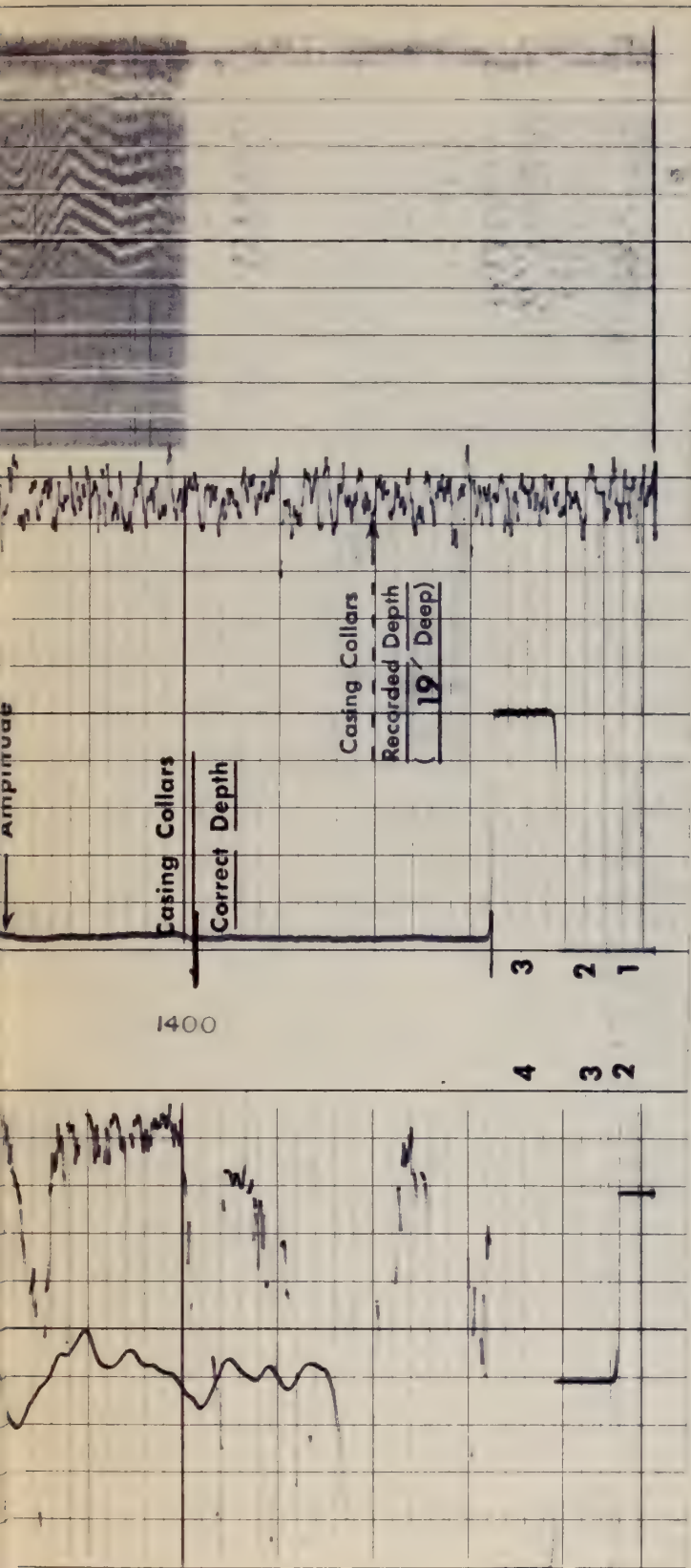
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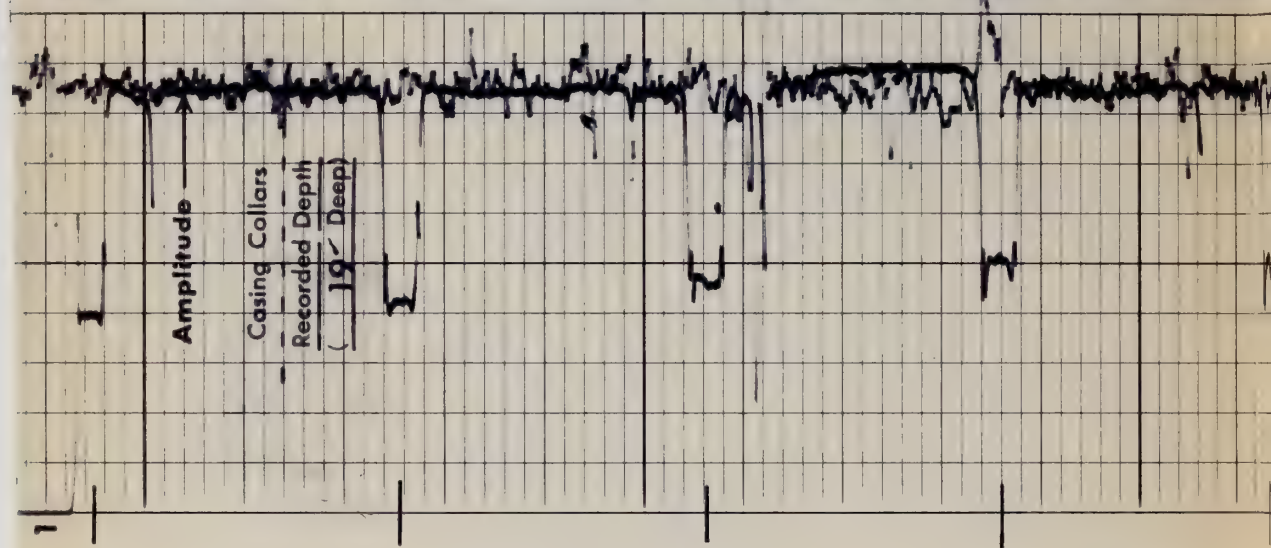
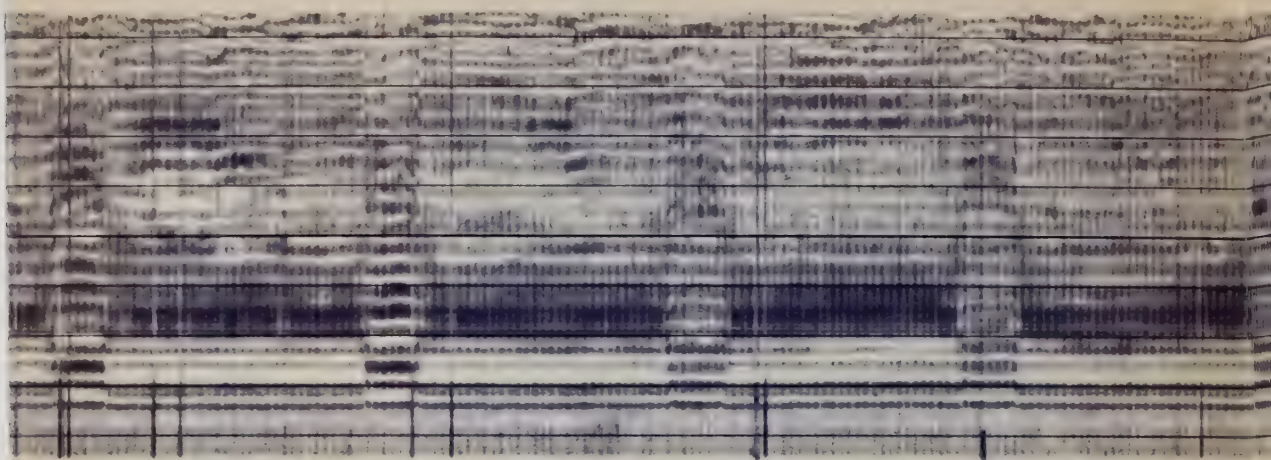


PROBABLY CEMENT FOR



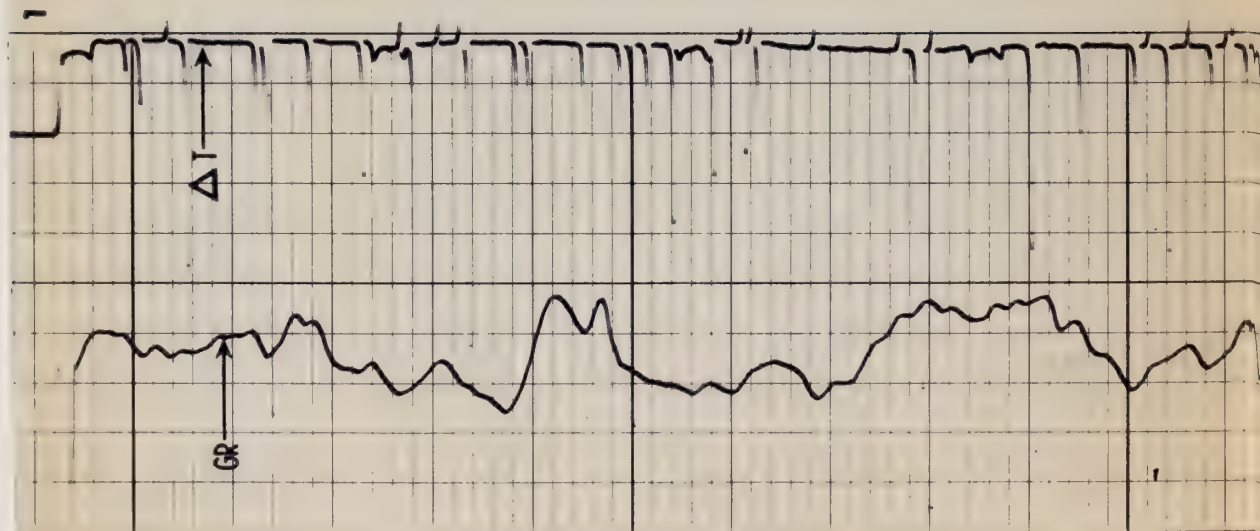


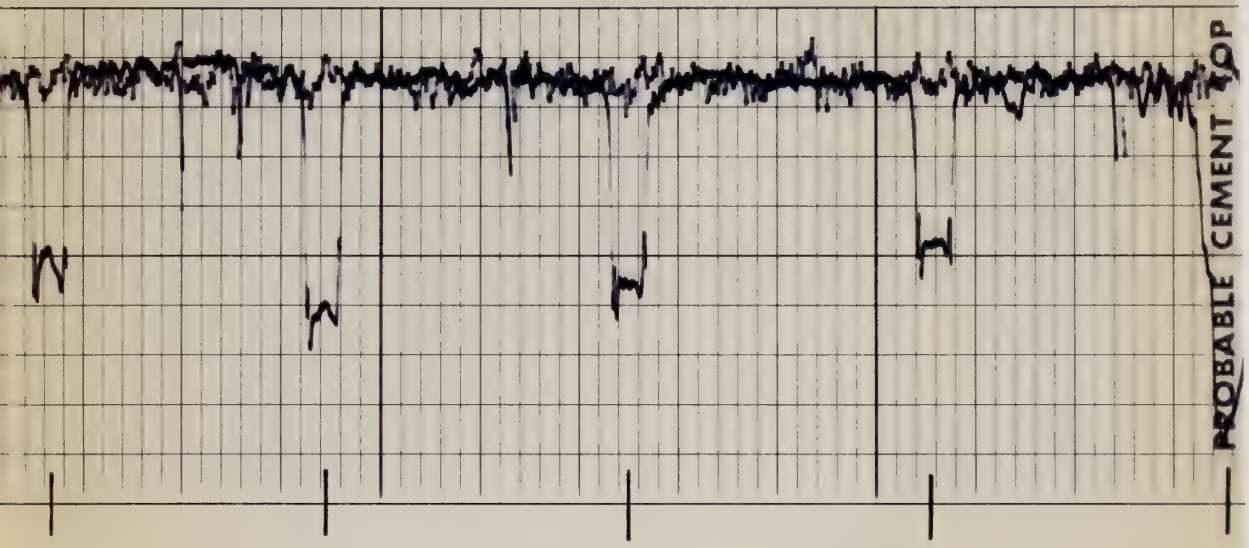
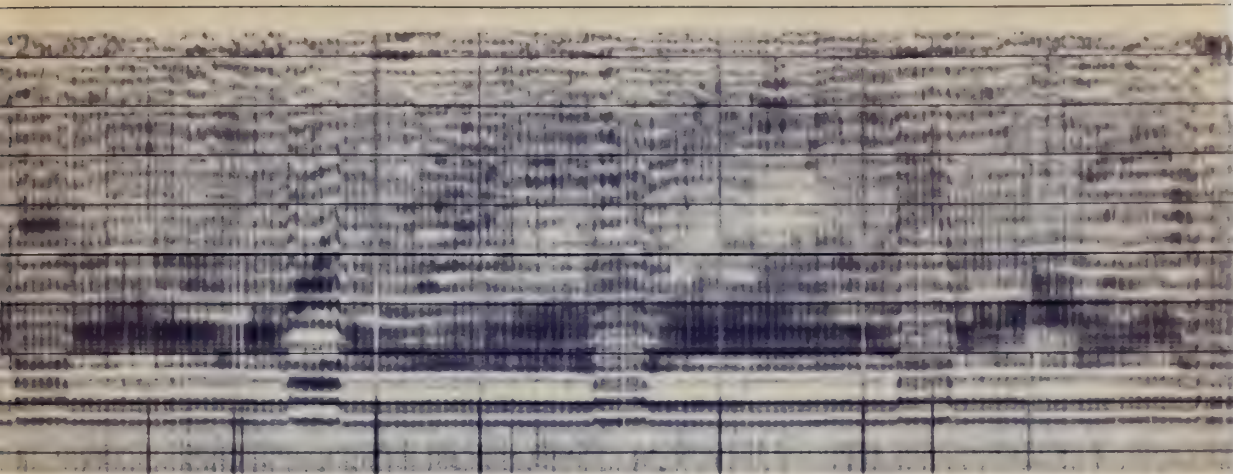




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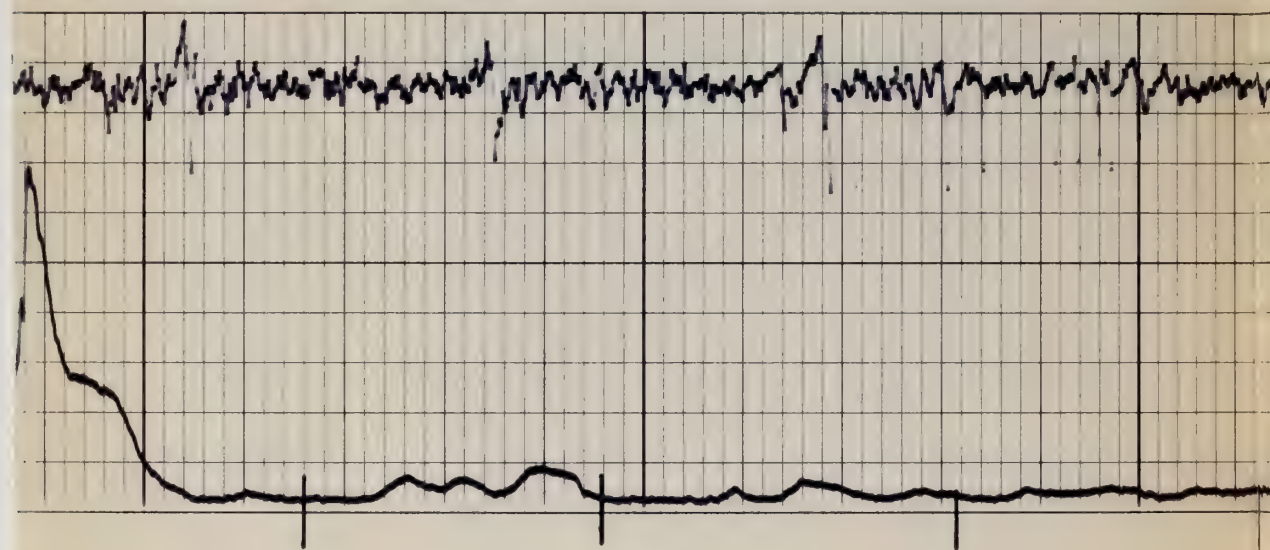
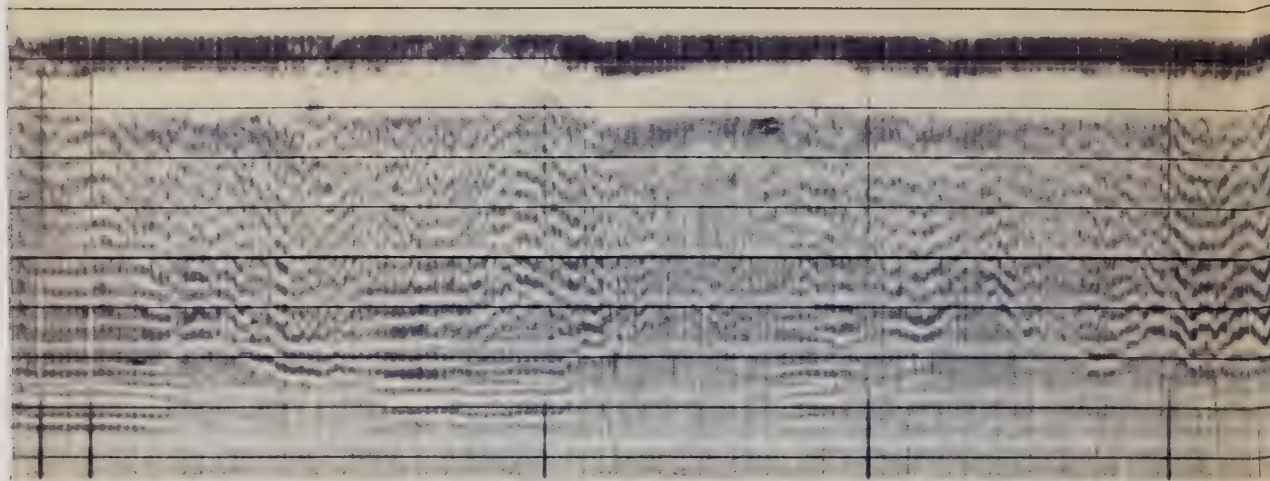




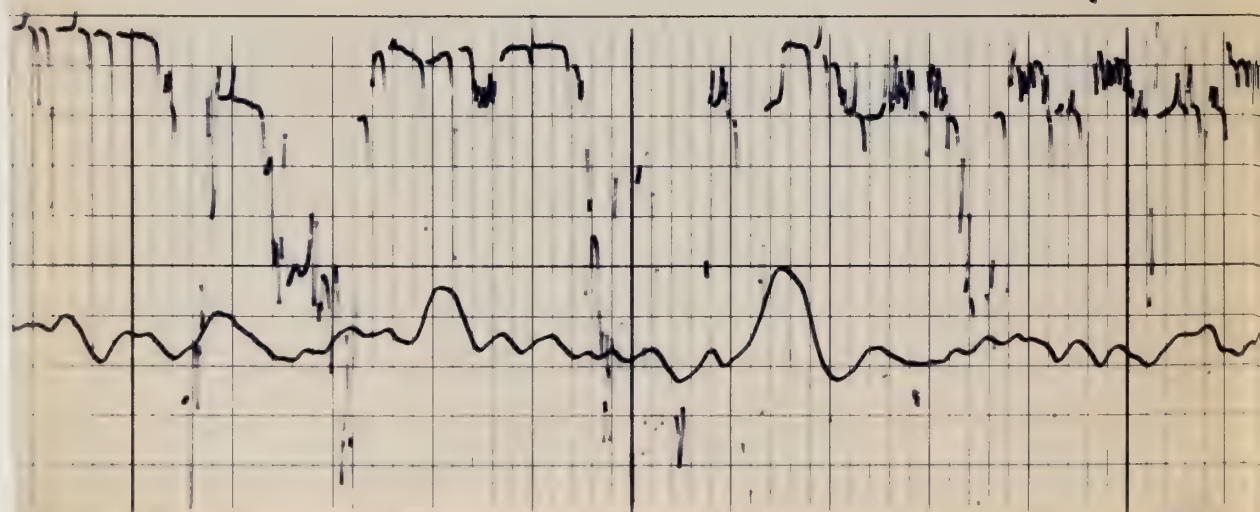
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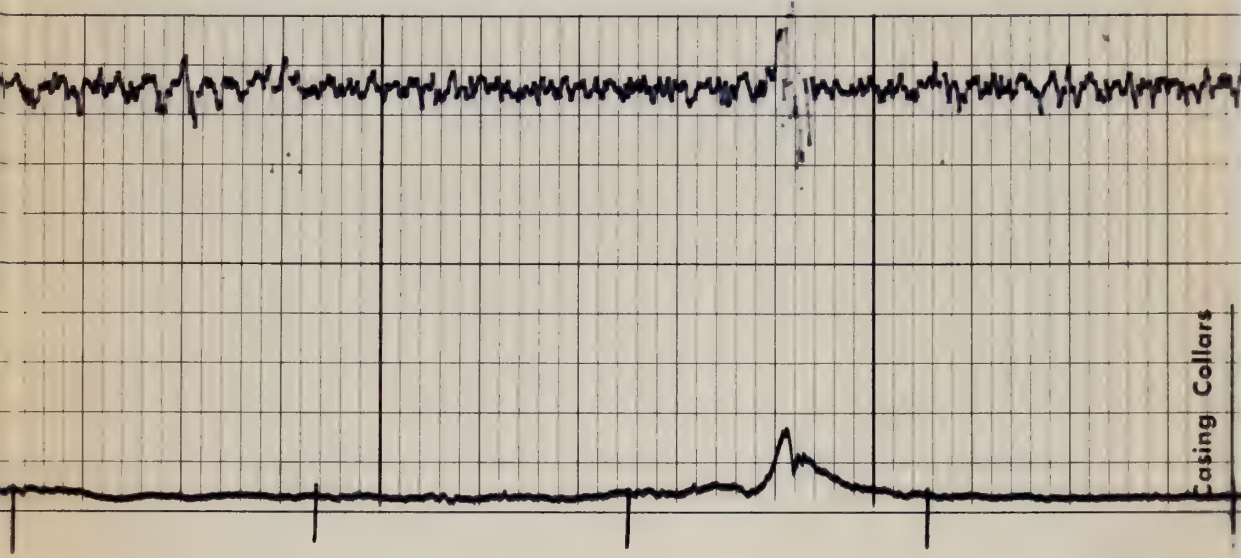
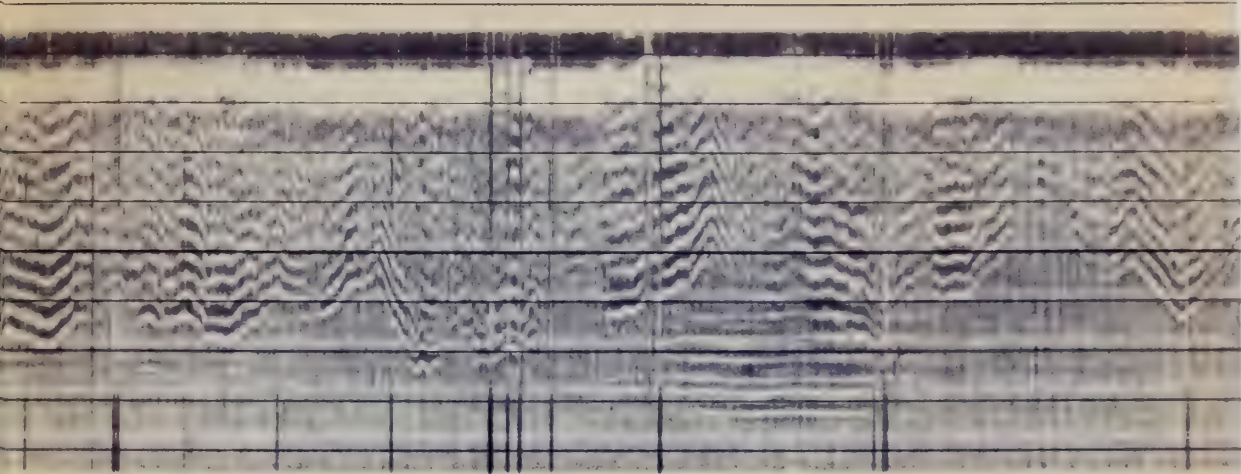
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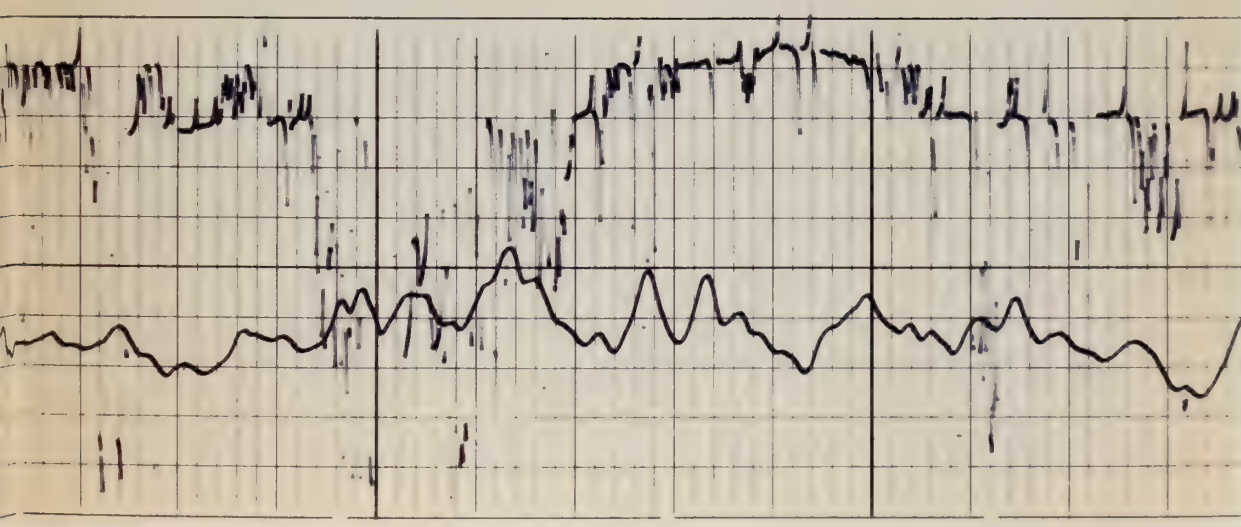


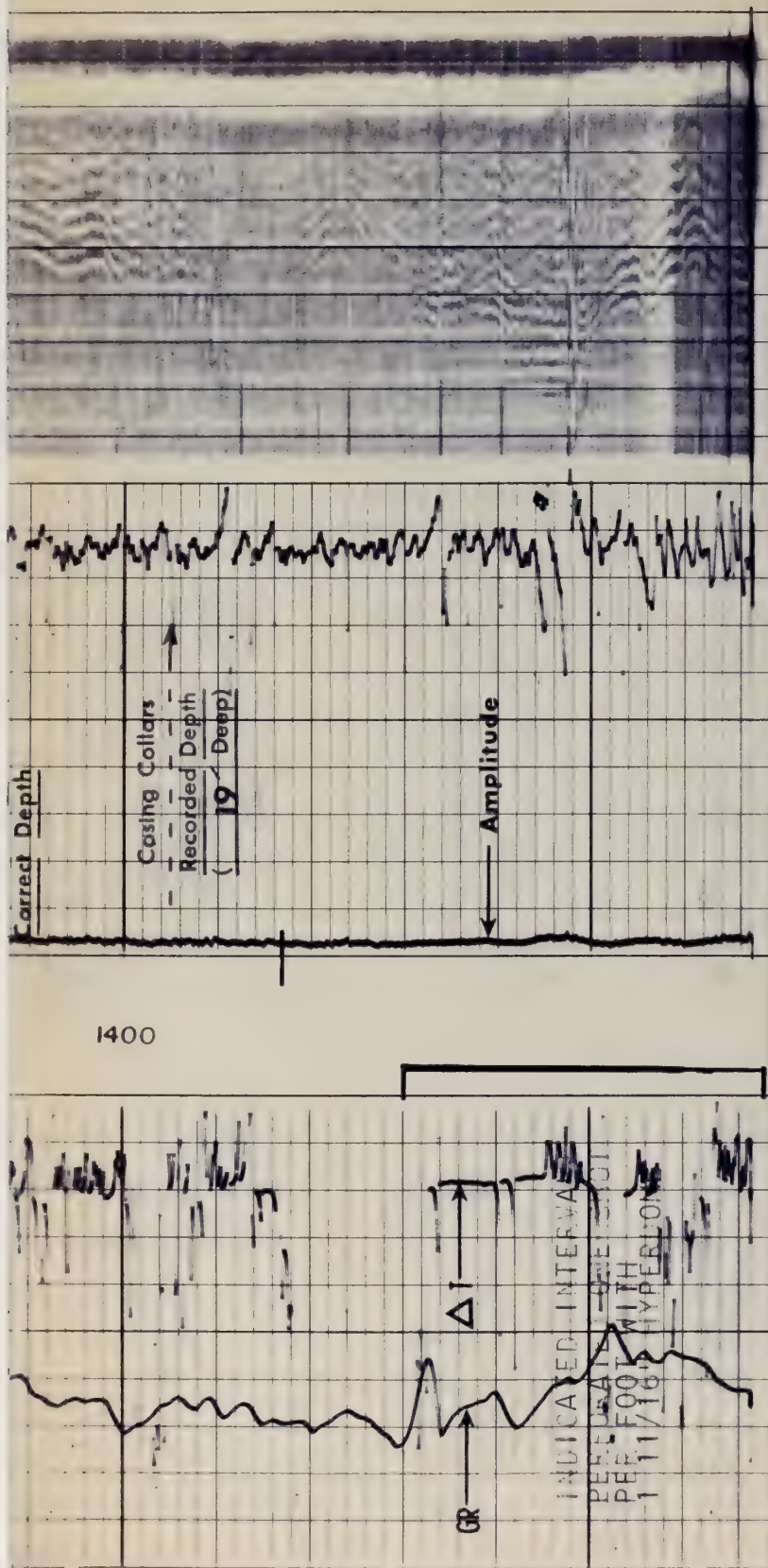
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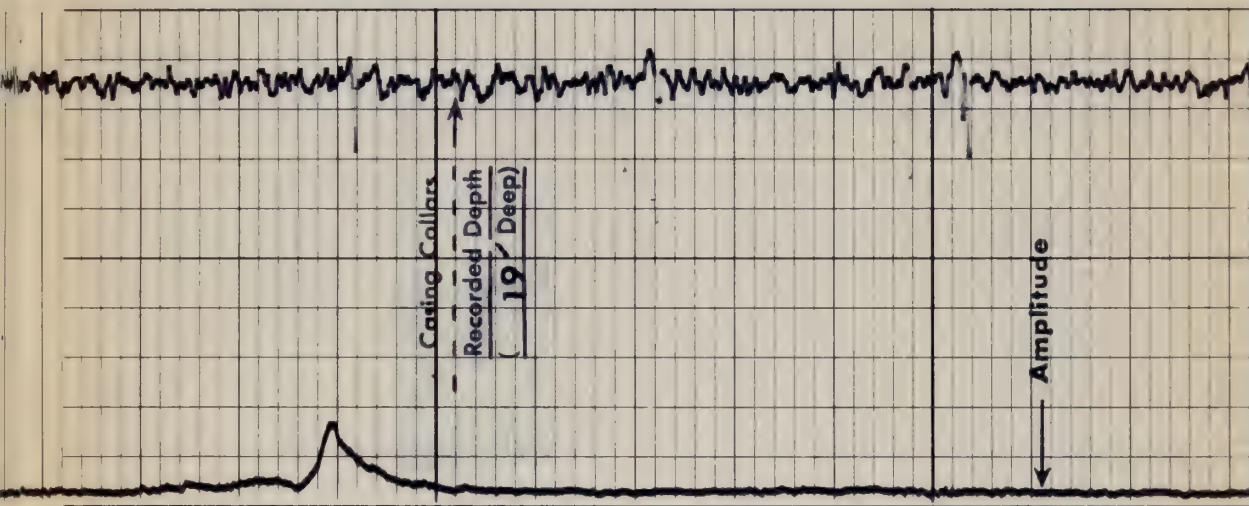
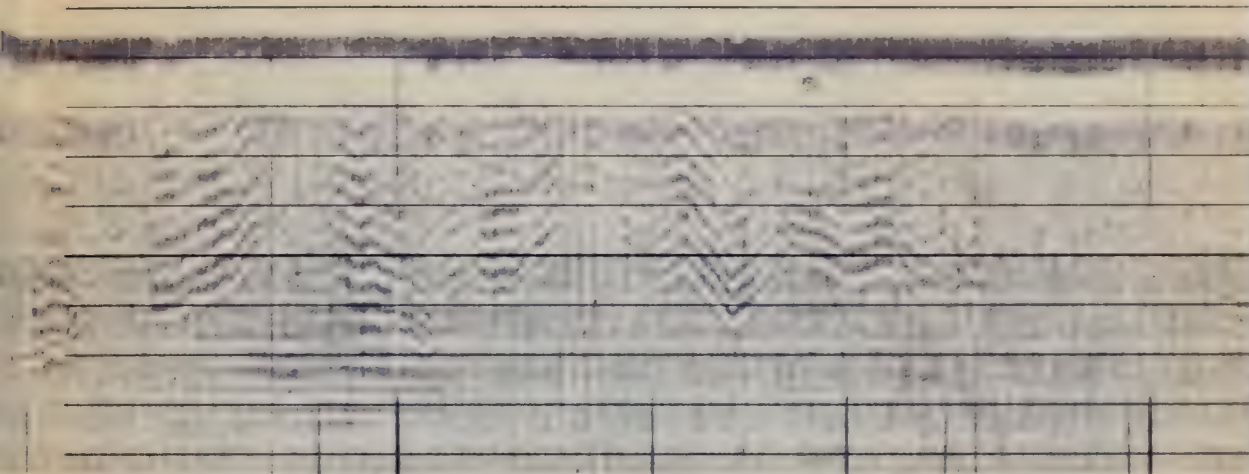




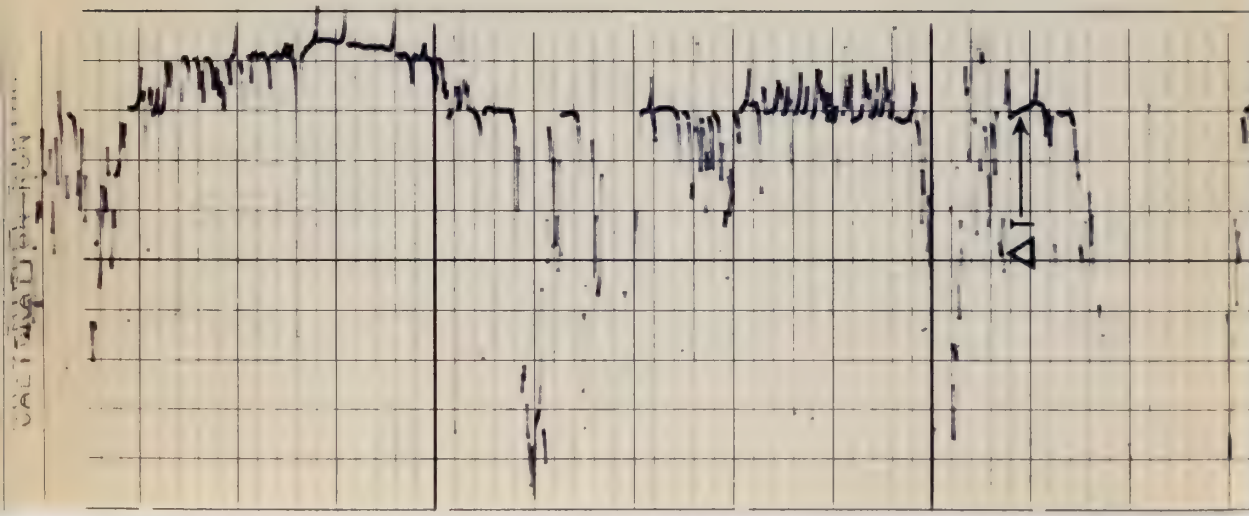
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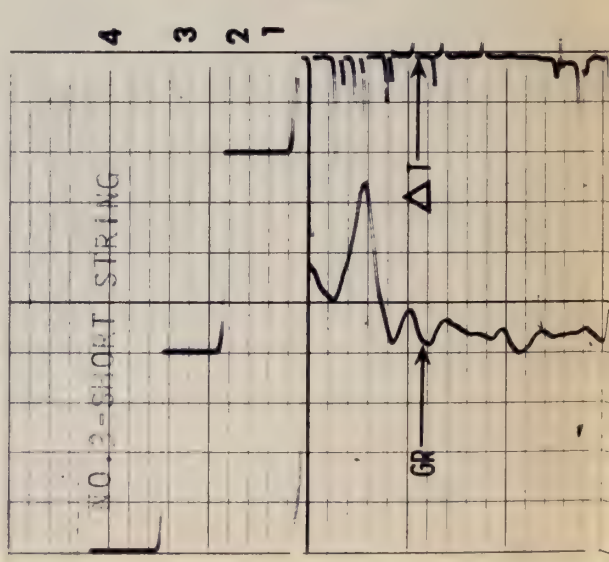
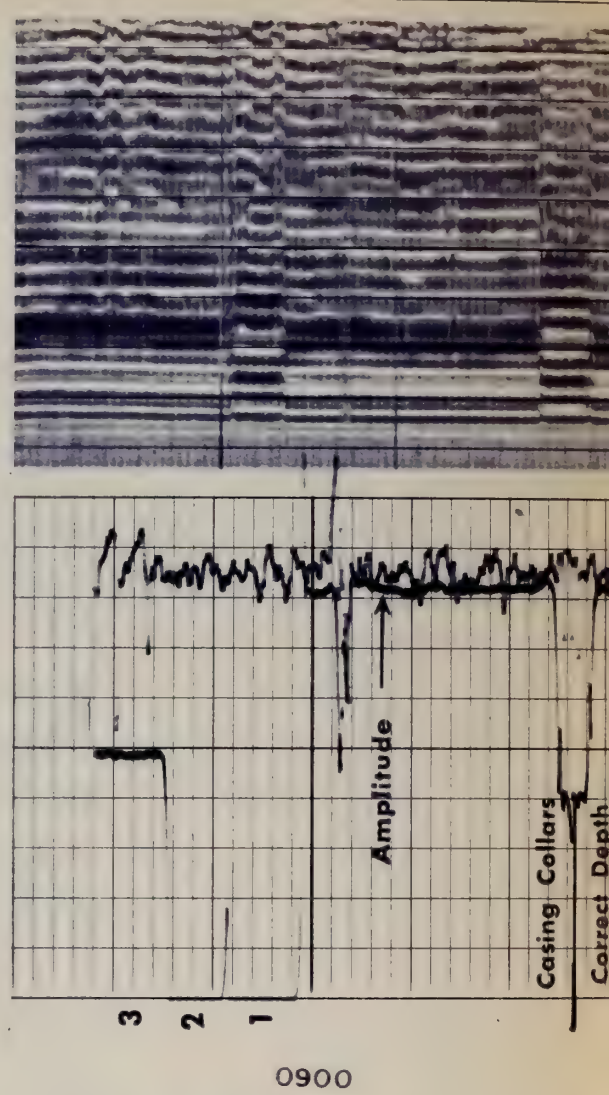
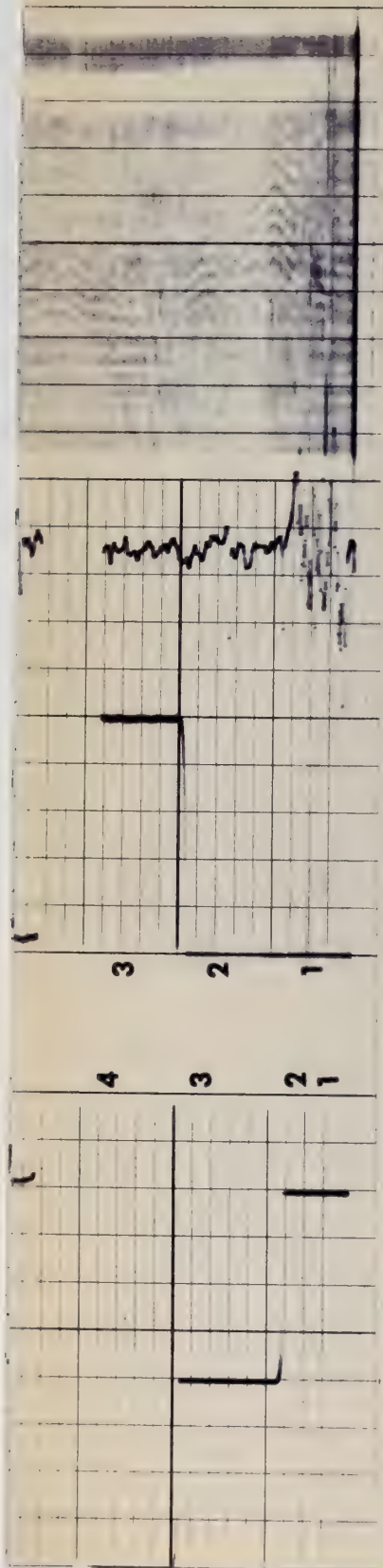


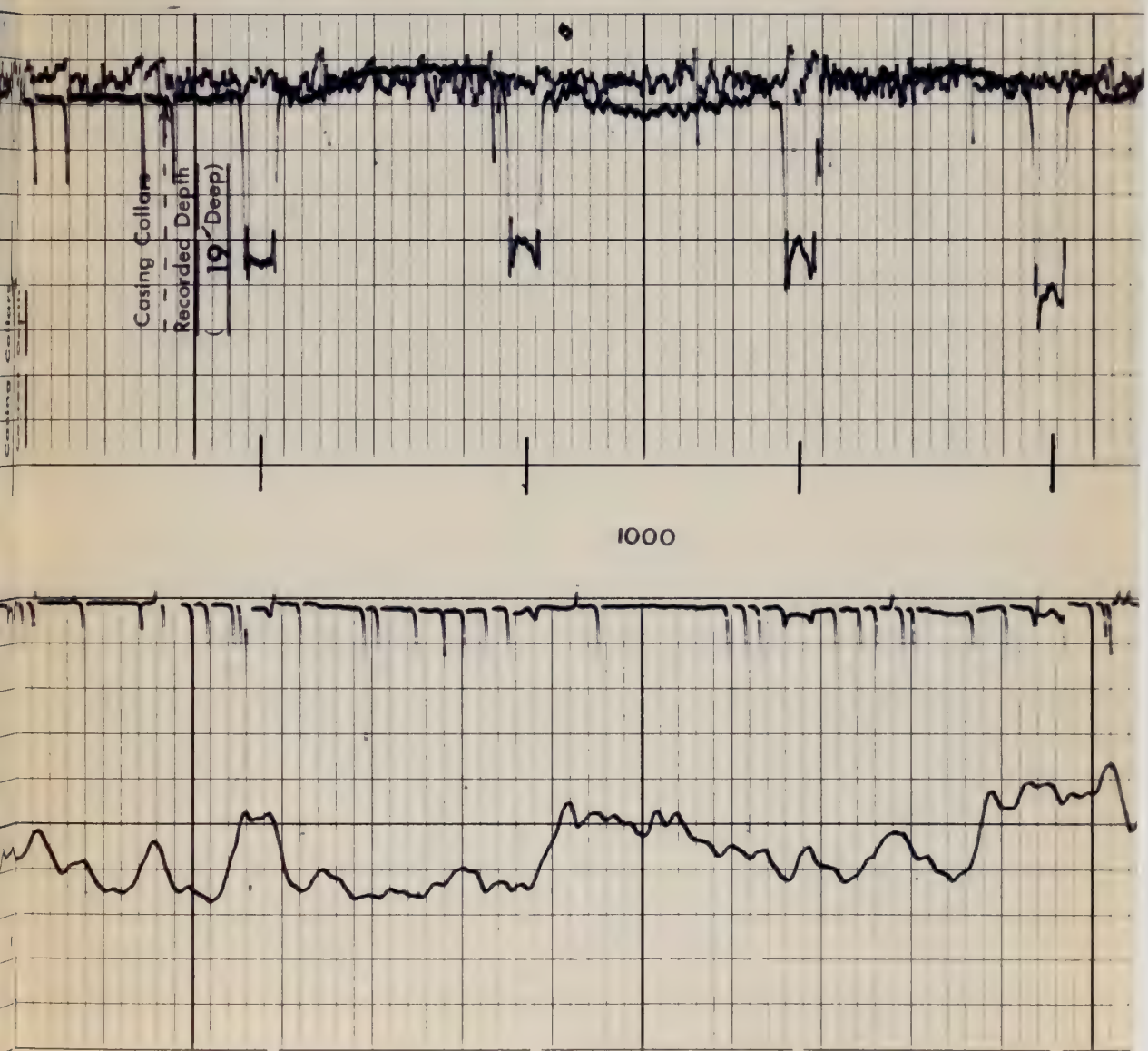
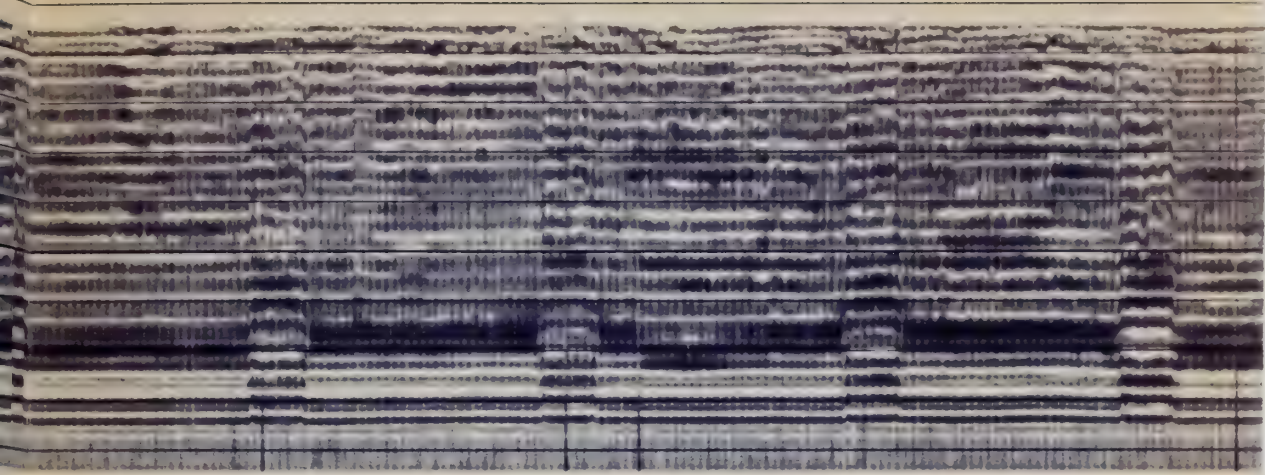


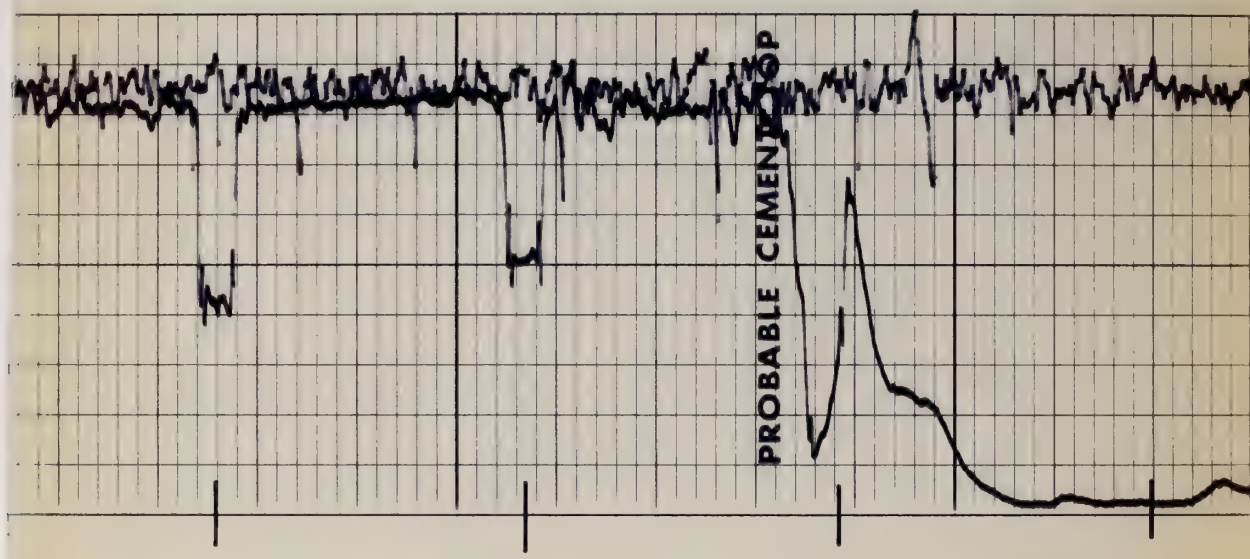
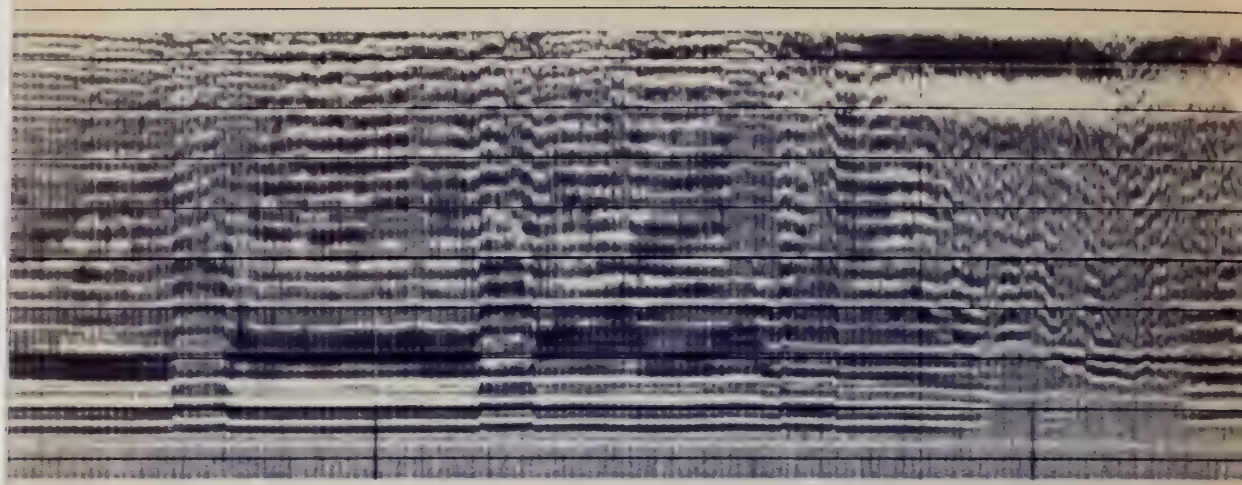


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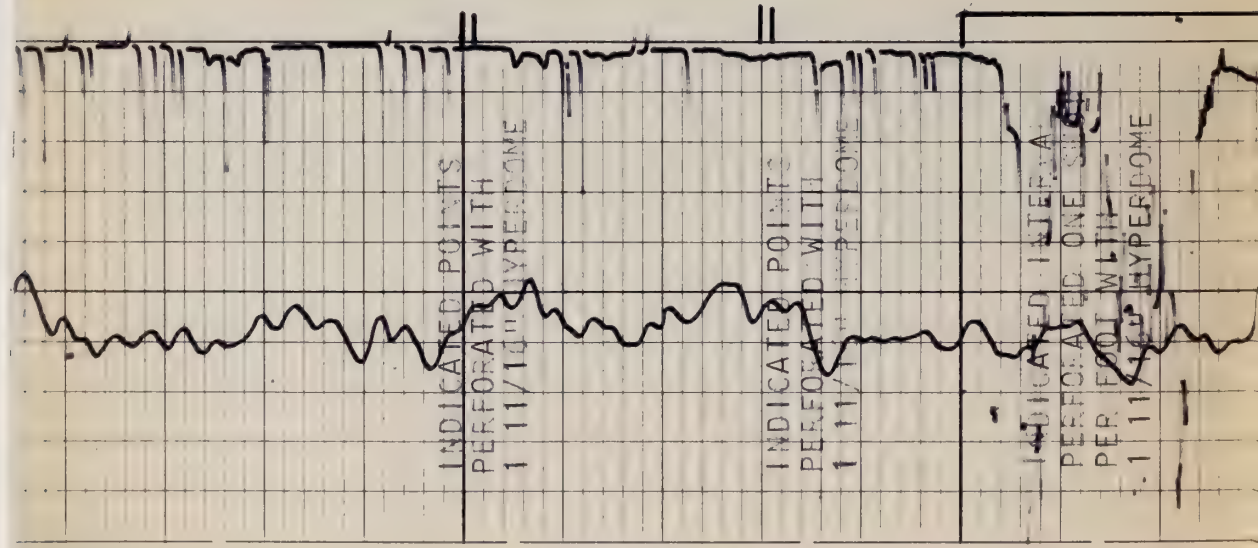






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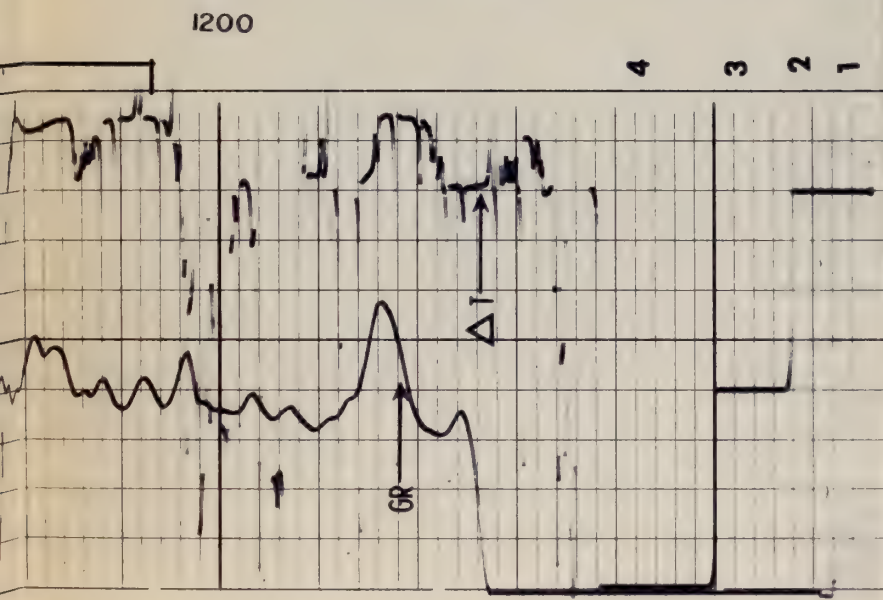
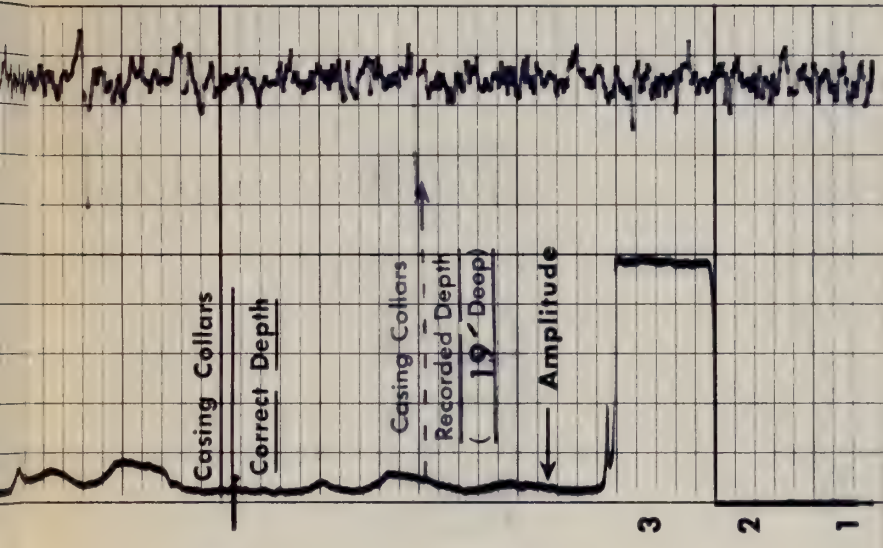
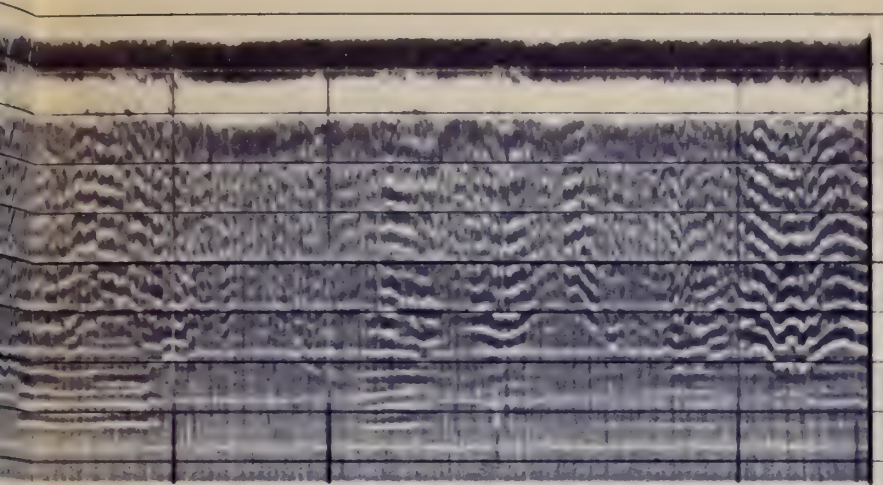
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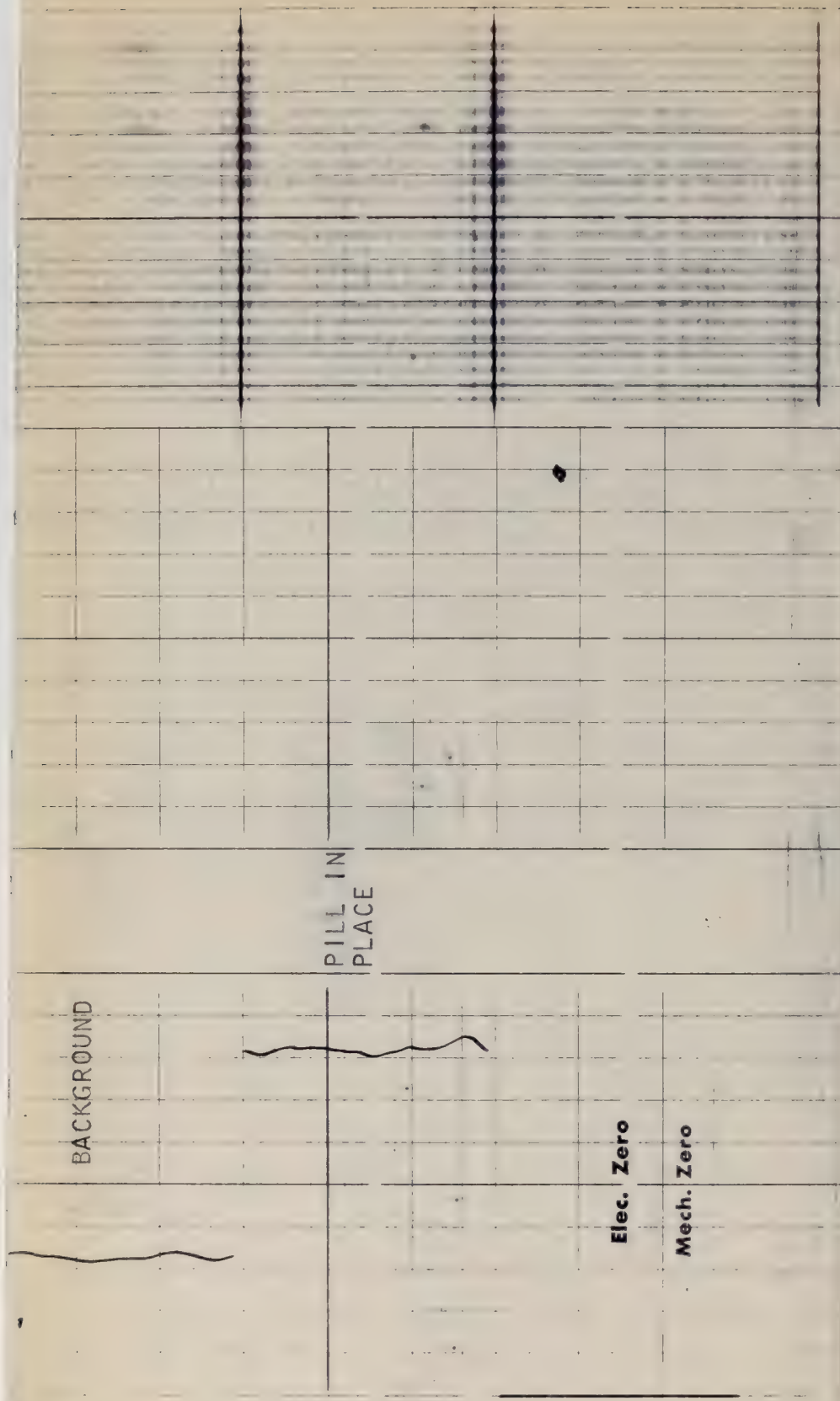
INDICATED POINTS
PERFORATED WITH
1 11/16" HYPERDOME

INDICATED POINTS
PERFORATED WITH
1 11/16" HYPERDOME

INDICATED INTERVAL
PERFORATED ONE SIGHT
PER FOOT WITH
1 11/16" HYPERDOME



GAMMA RAY CALIBRATION



HERE

TRANSIT TIME

MICROSECONDS _____ SPACING _____

CASING BOND

MILLIVOLTS

Casing Collars

Corrected Depth

VARIABLE DENSITY

MICROSECONDS _____ 5 FT. SPACING _____

TRANSIT TIME MICROSECONDS 400		CASING BOND MICROSECONDS 0		VARIABLE DENSITY MICROSECONDS 200	
GAMMA RAY API UNITS		DEPTH			
COMPANY ATLANTIC RICHFIELD COMPANY		SCHL. FR 1432-1467			
WELL SG NO.6		SCHL. TD 1458-1475			
FIELD		DRLR TD 2220-1474			
COUNTY RIO BLANCO		Elev:		KB ---- DF ---- GL 6888	
STATE COLORADO					

CEMENT BOND CALIBRATION CODING		
	Δt	AMPLITUDE
1. MECHANICAL ZERO		MECHANICAL ZERO
2. 240 μ sec		ELECTRICAL ZERO
3. 320 μ sec		CALIBRATE
4. 400 μ sec		

[illegible]

Schlumberger**ORIENTED PERFORATING RECORD
AND CASING COLLAR LOG**

COUNTY	RIO BLANCO	COMPANY	ATLANTIC RICHFIELD COMPANY
FIELD or LOCATION	SORGHUM GULCH	WELL	S.G. NO. 6
WELL	S.G. NO. 6	FIELD	SORGHUM GULCH
COMPANY	ATLANTIC RICHFIELD COMPANY	COUNTY	RIO BLANCO
		STATE	COLORADO
Location:		Other Services:	
2523 FSL -		CBL-GR-VOL	
2251 FSL			
Sec. 7 Twp. 3S Rge. 96E			

Permanent Datum: GROUND LEVEL; Elev.: 6888
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6888

Date	9/16/74
Run No.	ONE
Pipe String No.	ONE/TWO/THREE
Pipe String Ident.	LONG/MIDDLE/SHORT
Type Orienting	POWERED

Type fluid in hole	WATER
Salinity, PPM Cl.	----
Density	----
Level	FULL

Max rec. temp., deg F.	----
Operating rig time	66 HOURS
Recorded by	ST. AUBIN
Witnessed by	MR. ROSS

BORE-HOLE RECORD**CEMENTING RECORD**

Bit	From	To	Type	Wgt.	From	To
6 1/2	59	2220	Primary			
			Squeeze			

FOLD HERE

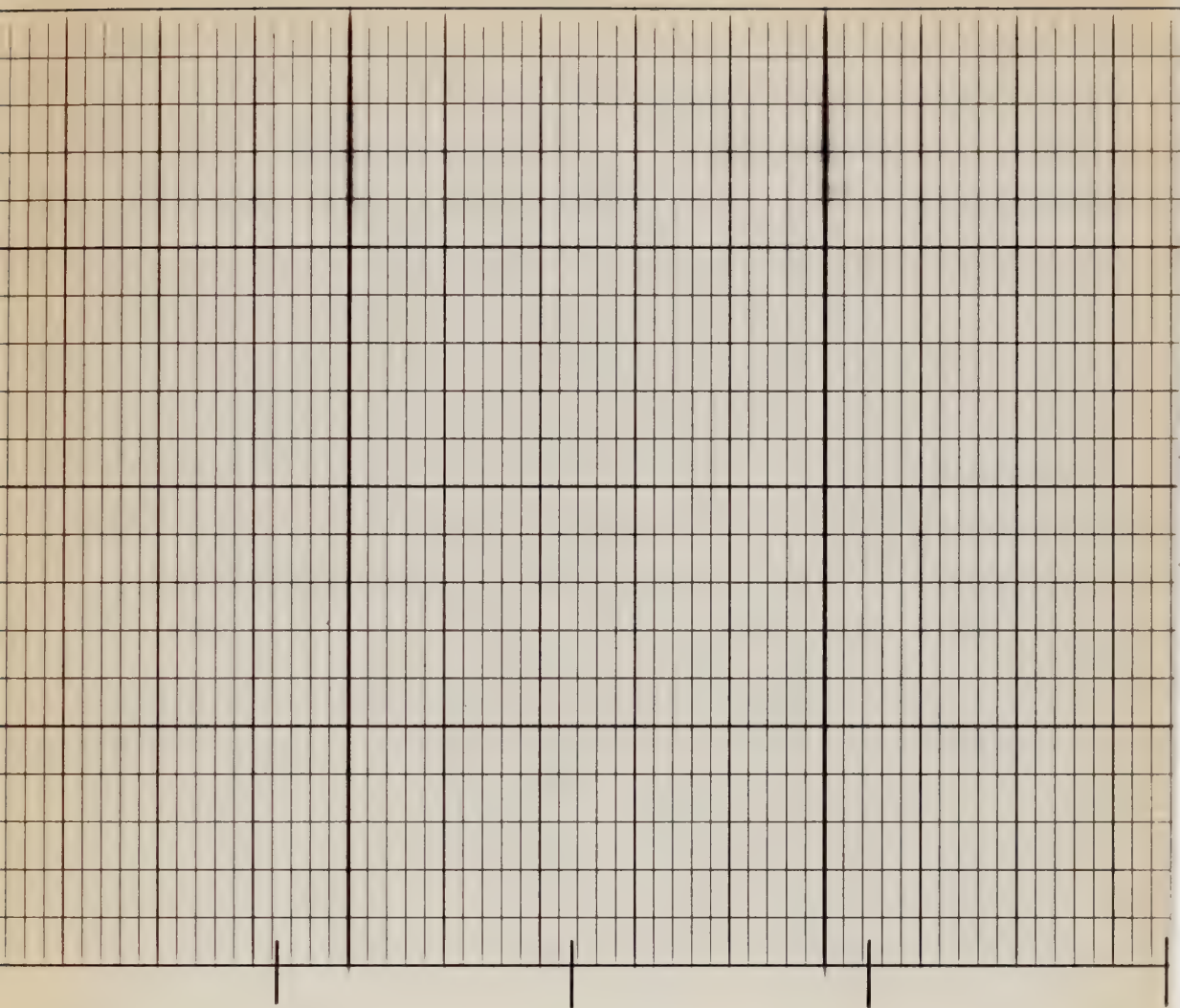
The well name, location and borehole reference data were furnished by the customer.

EQUIPMENT DATA				DEPTHS RELATE TO		CASING COLLARS	
Hoist Truck No.	3362	Rotator Size		Radioactivity Measurements <input checked="" type="checkbox"/>			
Inst. Truck No.	3362	Rotator No.		Schlumberger Line Measurements <input type="checkbox"/>			
Tool Serial No.		Indexer Type					
Location	VERNAL	Indexer No.					

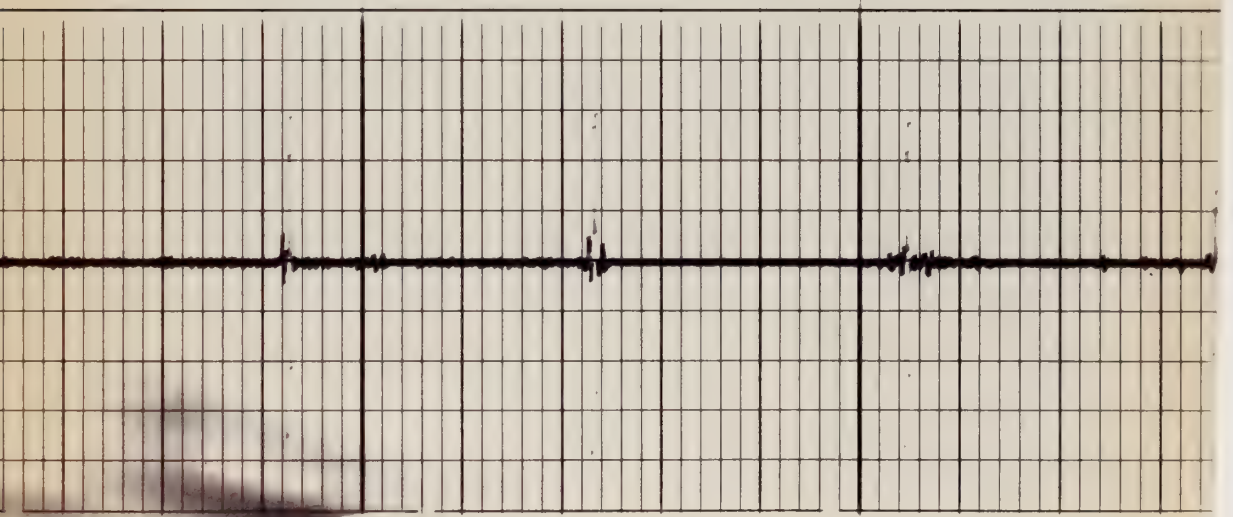
PERFORATING DATA				LOGGING DATA				PIPE STRING RECORD					
Depths		No.	Gun	Time	Sens.	Zero	Calib.						
From	To	Shots	Type	Const.	Setting	Shift	Sens.	Calib.	Defl.				
NO. 1 - LONG STRING		537	1 11/16"	HYPERDOME						1	2	3	4
1025	2161									Identific'n	LONG	MIDDLE	SHORT
NO. 2 - MIDDLE STRING		41	1 11/16"	HYPERDOME						Size	2 3/8	2 3/8	2 5/8
1430	1470									Weight	4.7	4.7	4.7
NO. 3 - SHORT STRING		43	1 11/16"	HYPERDOME						Depth	2220	1466	1194
1100	1190												

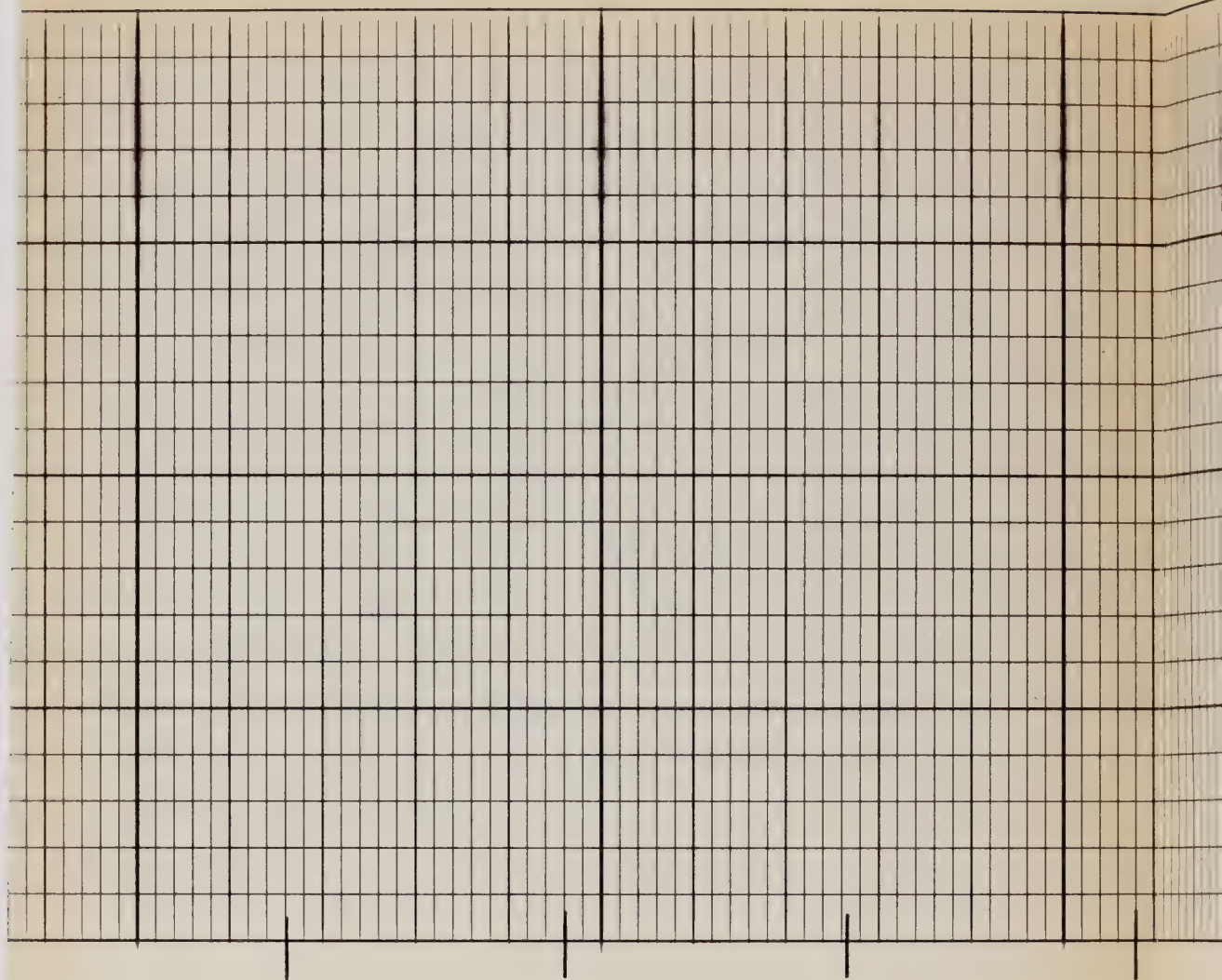
Remarks:

CASING COLLAR LOG BEFORE PERFORATION		DEPTHS		
		0900		

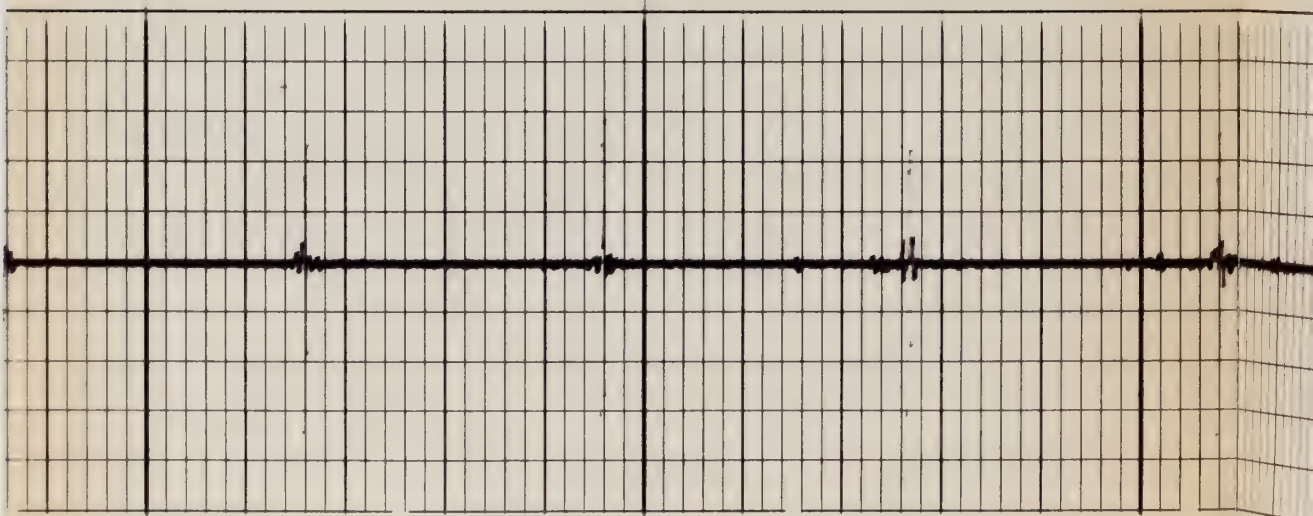


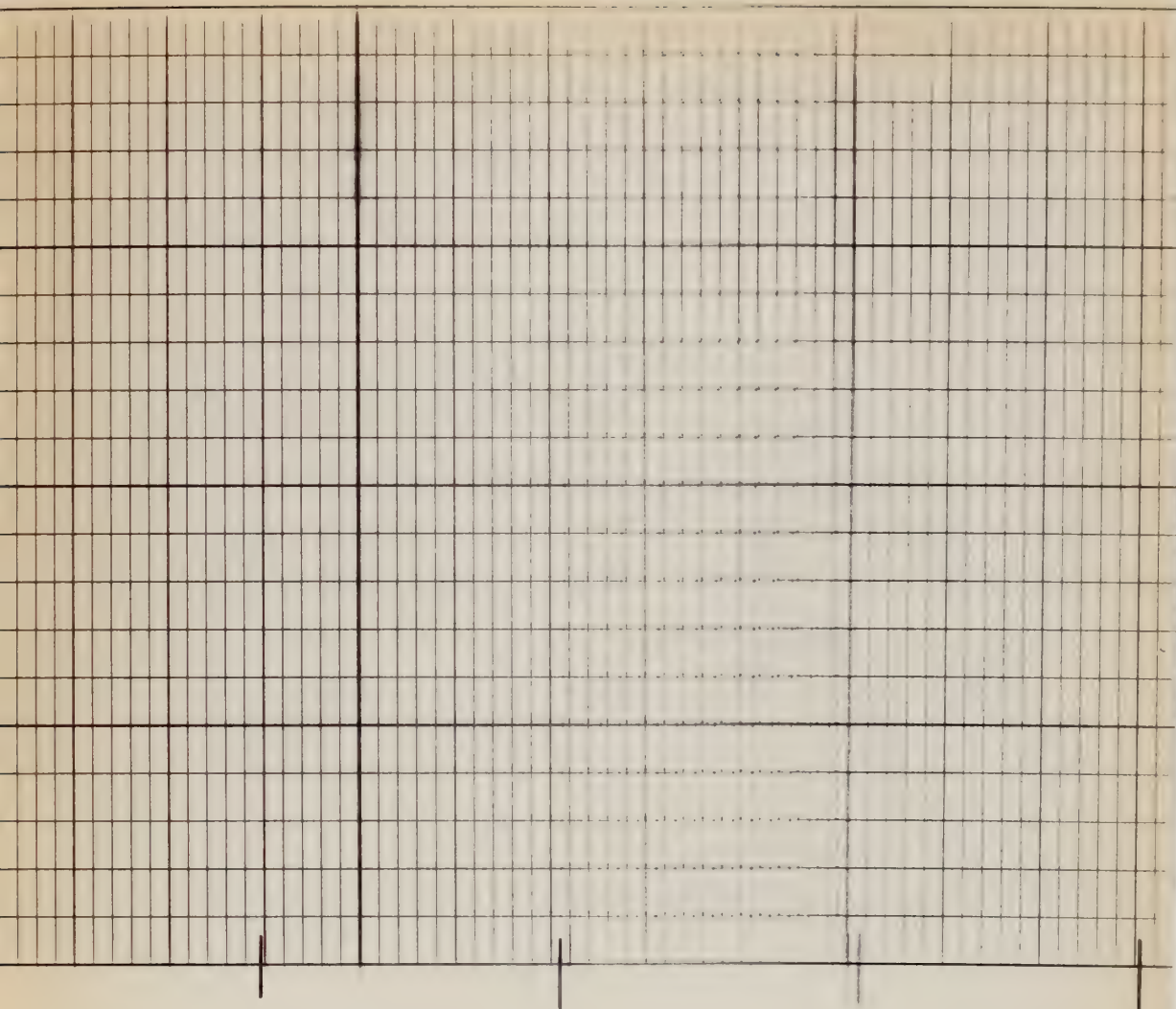
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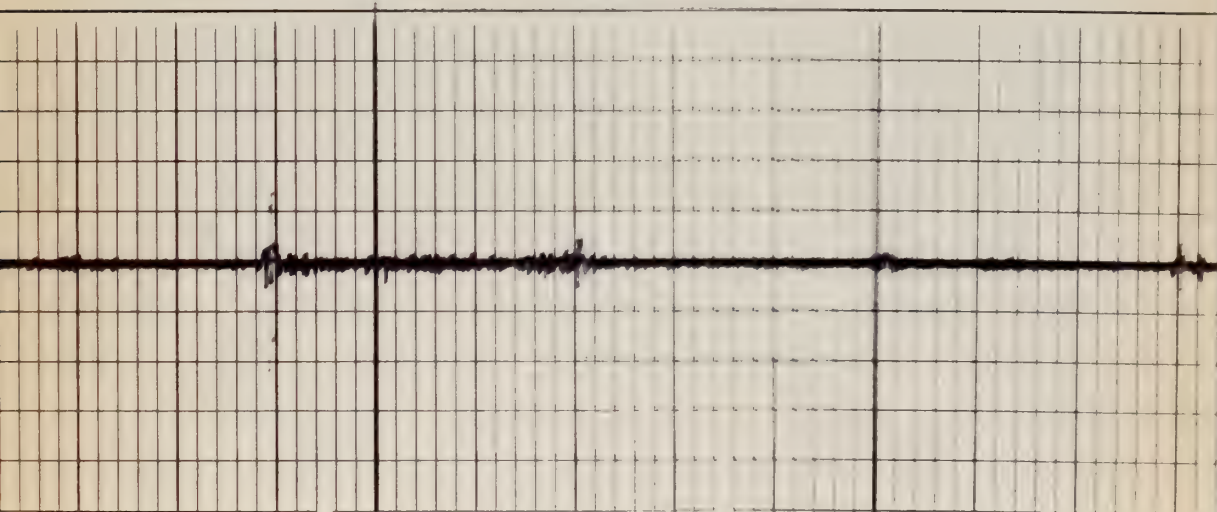


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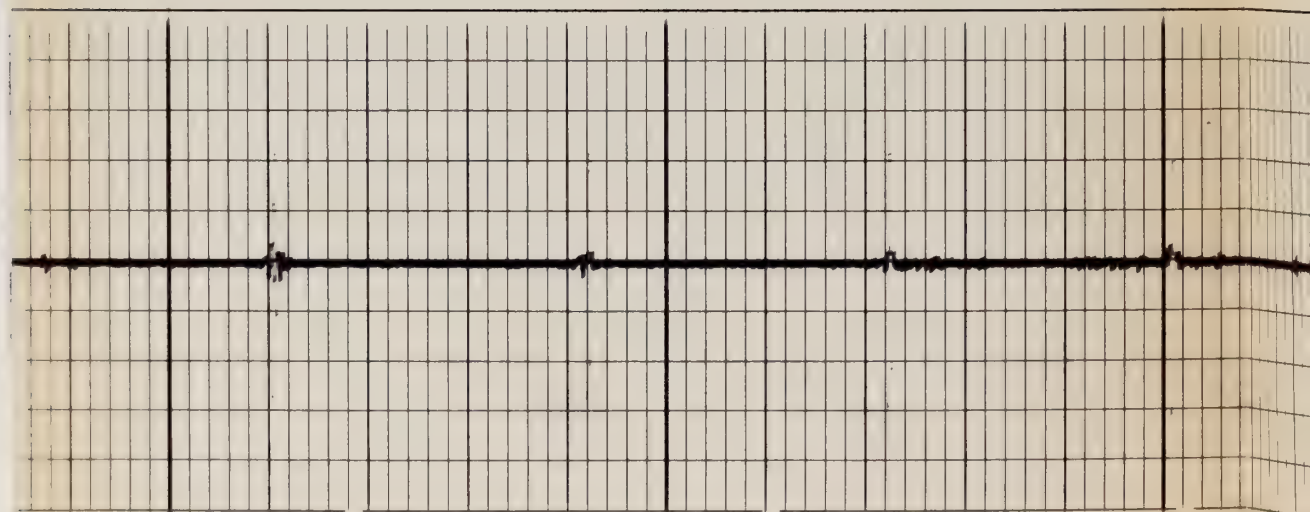
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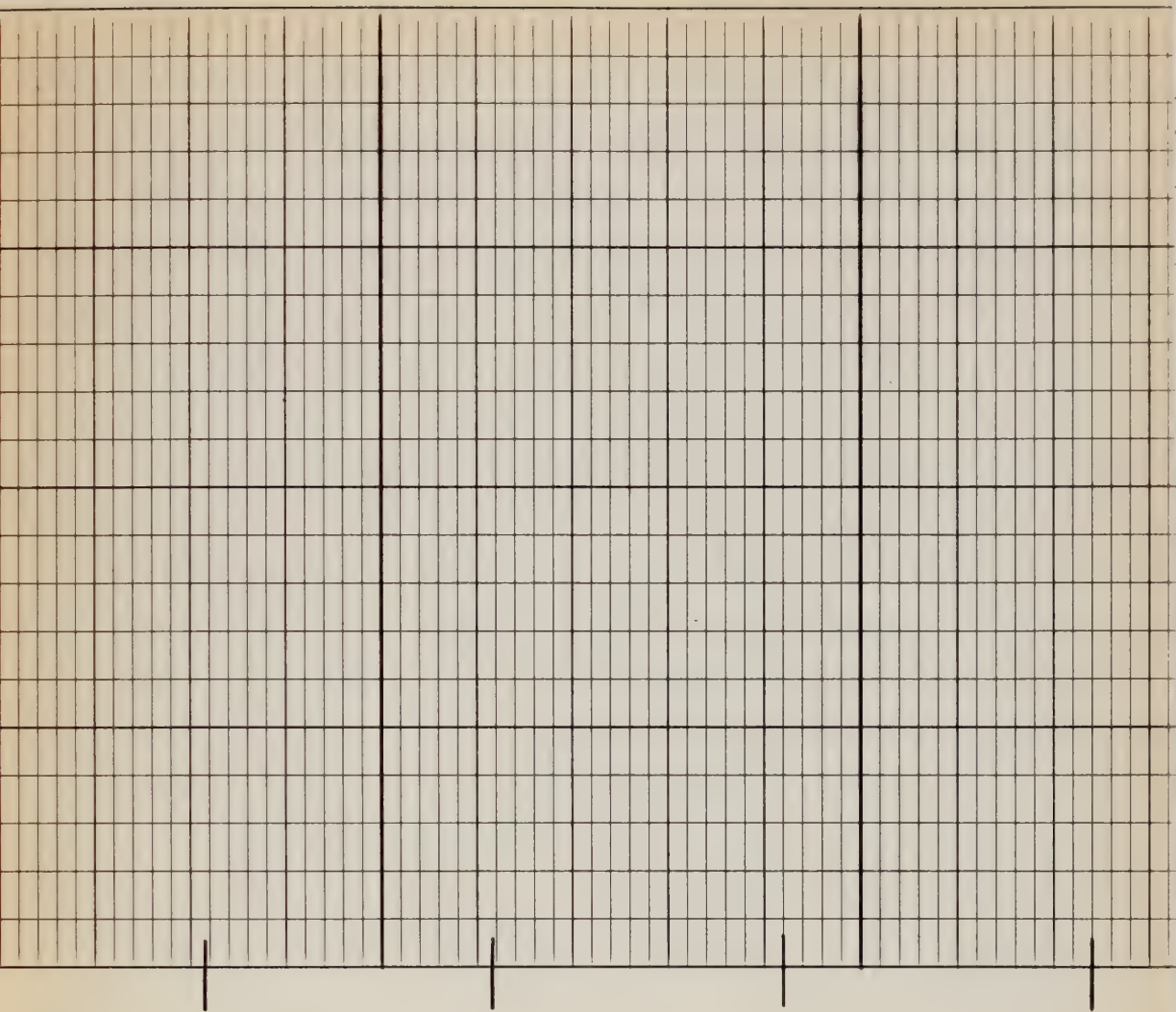




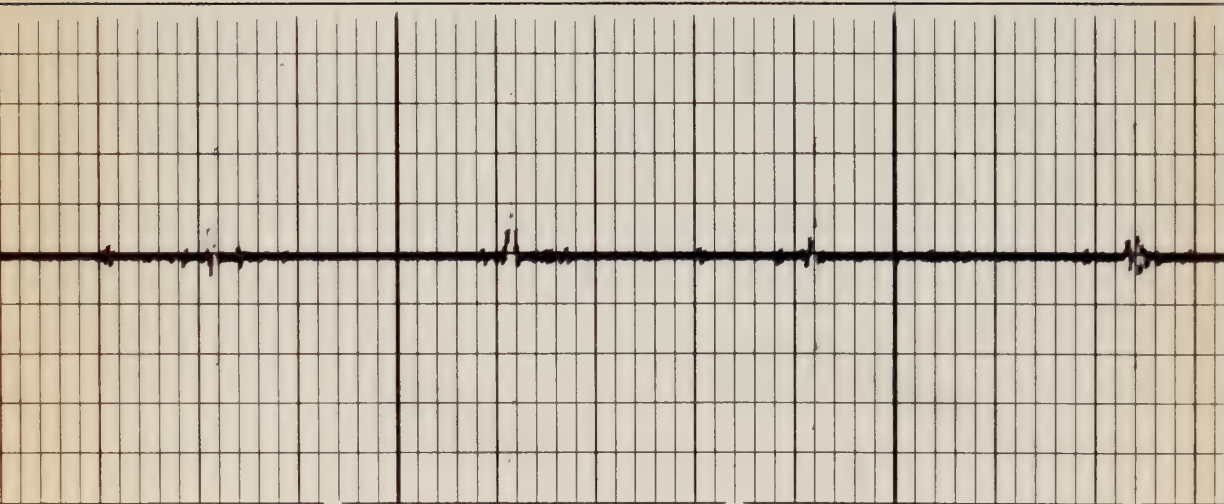
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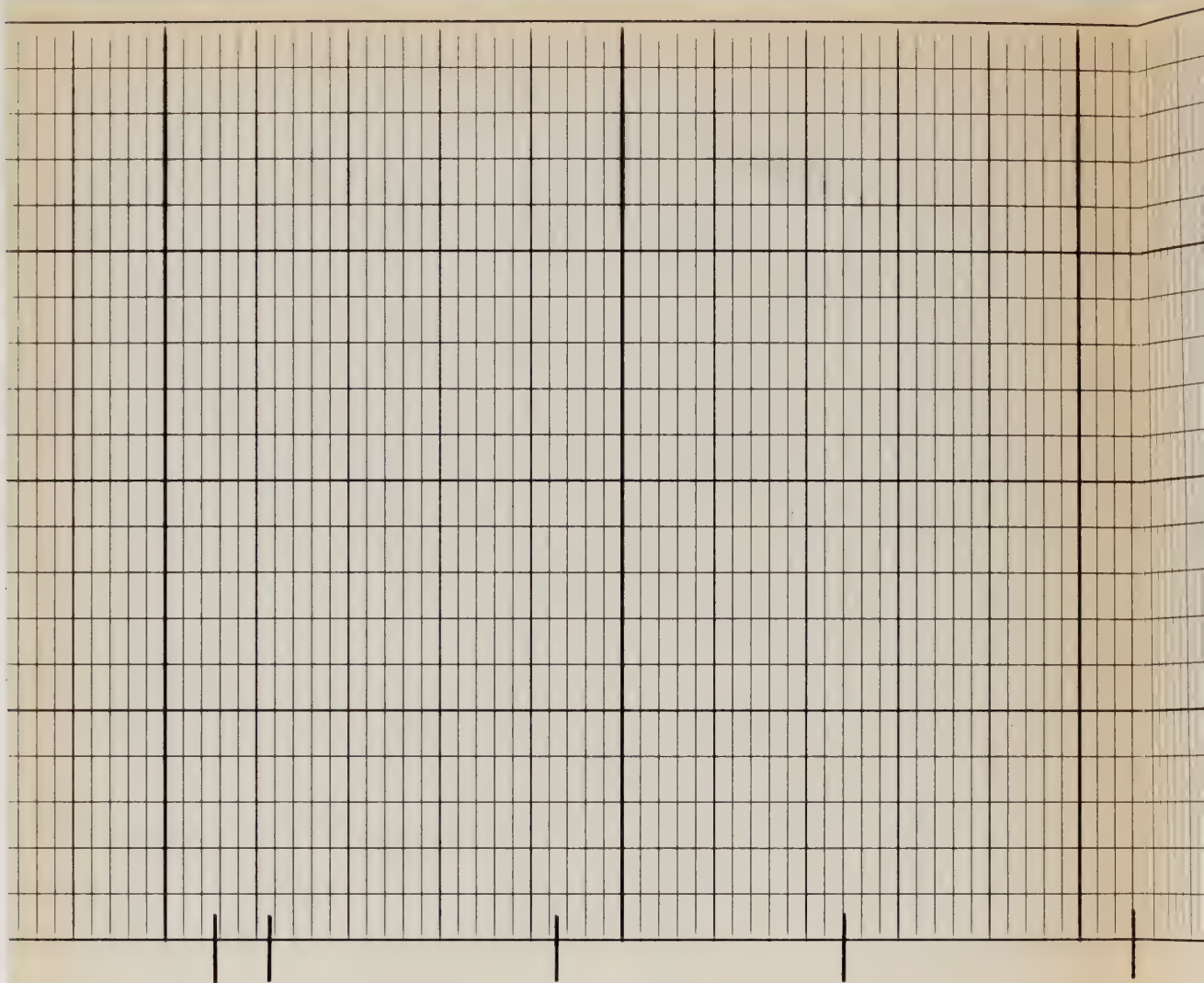
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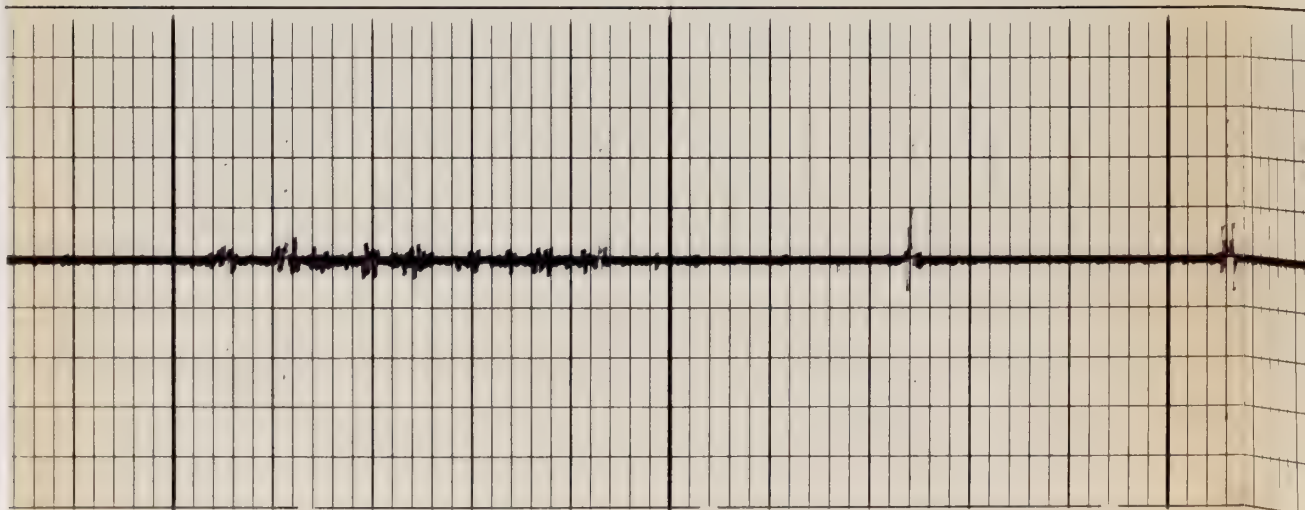


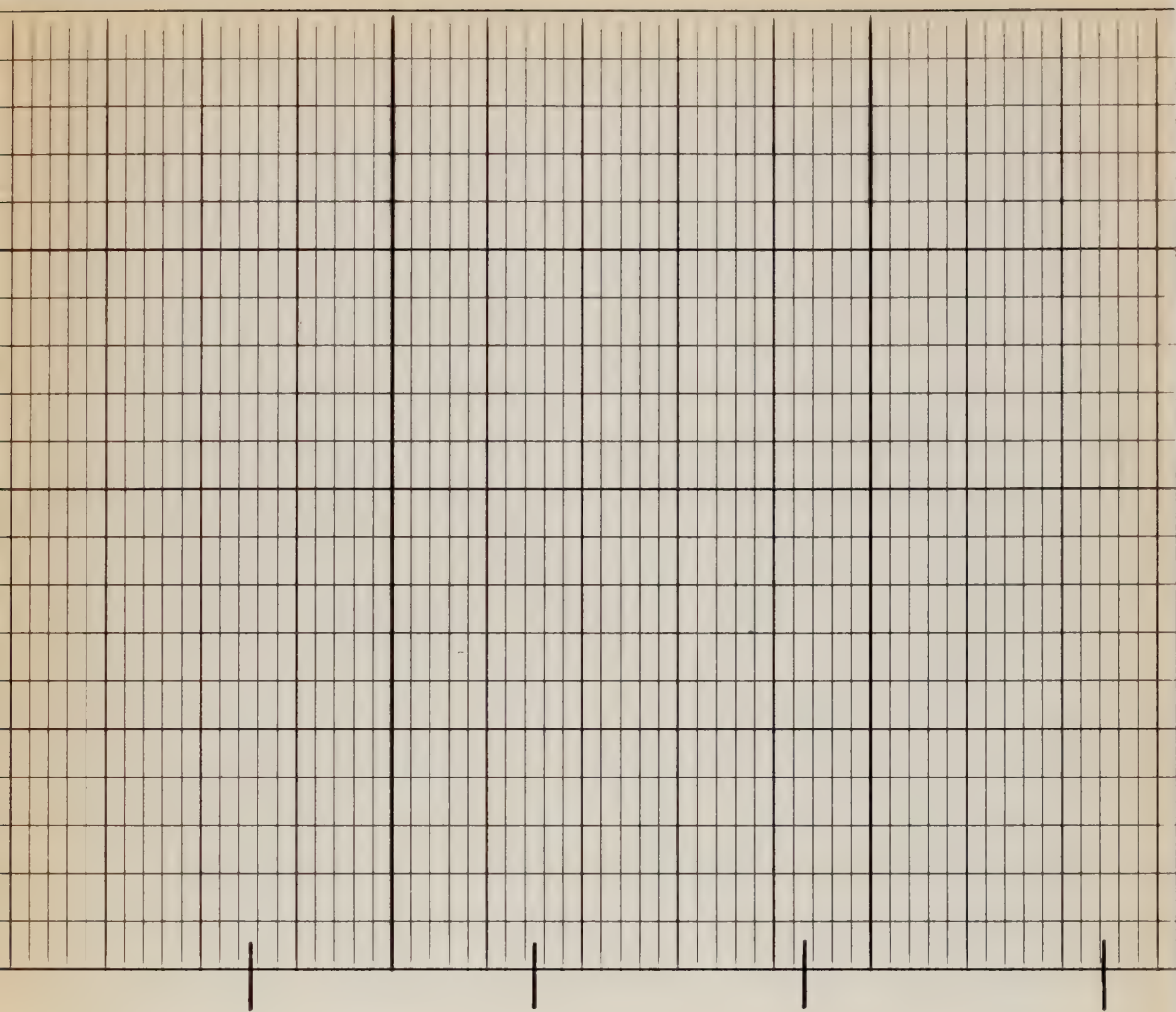
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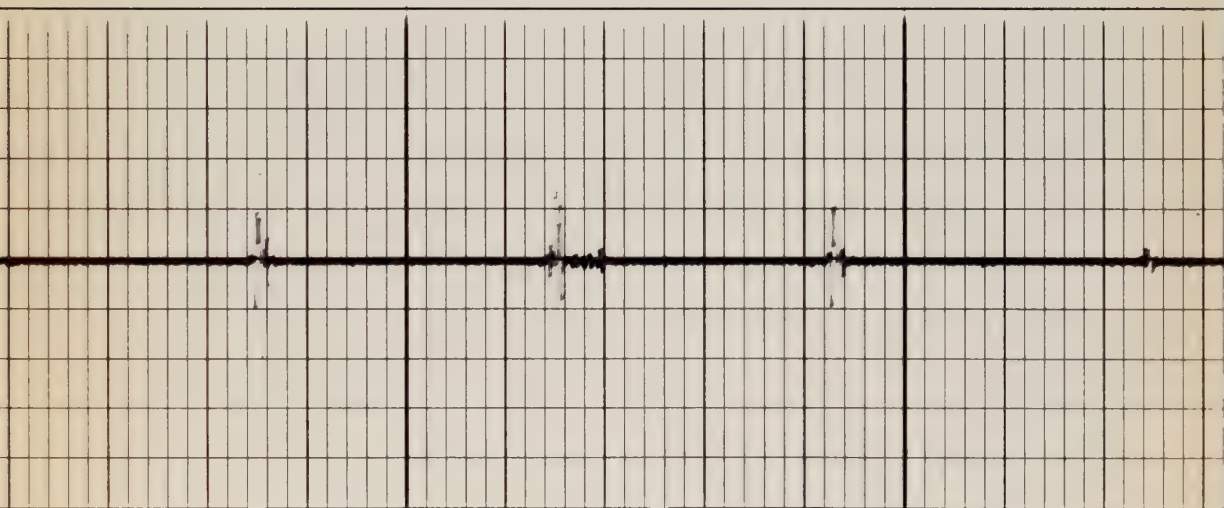


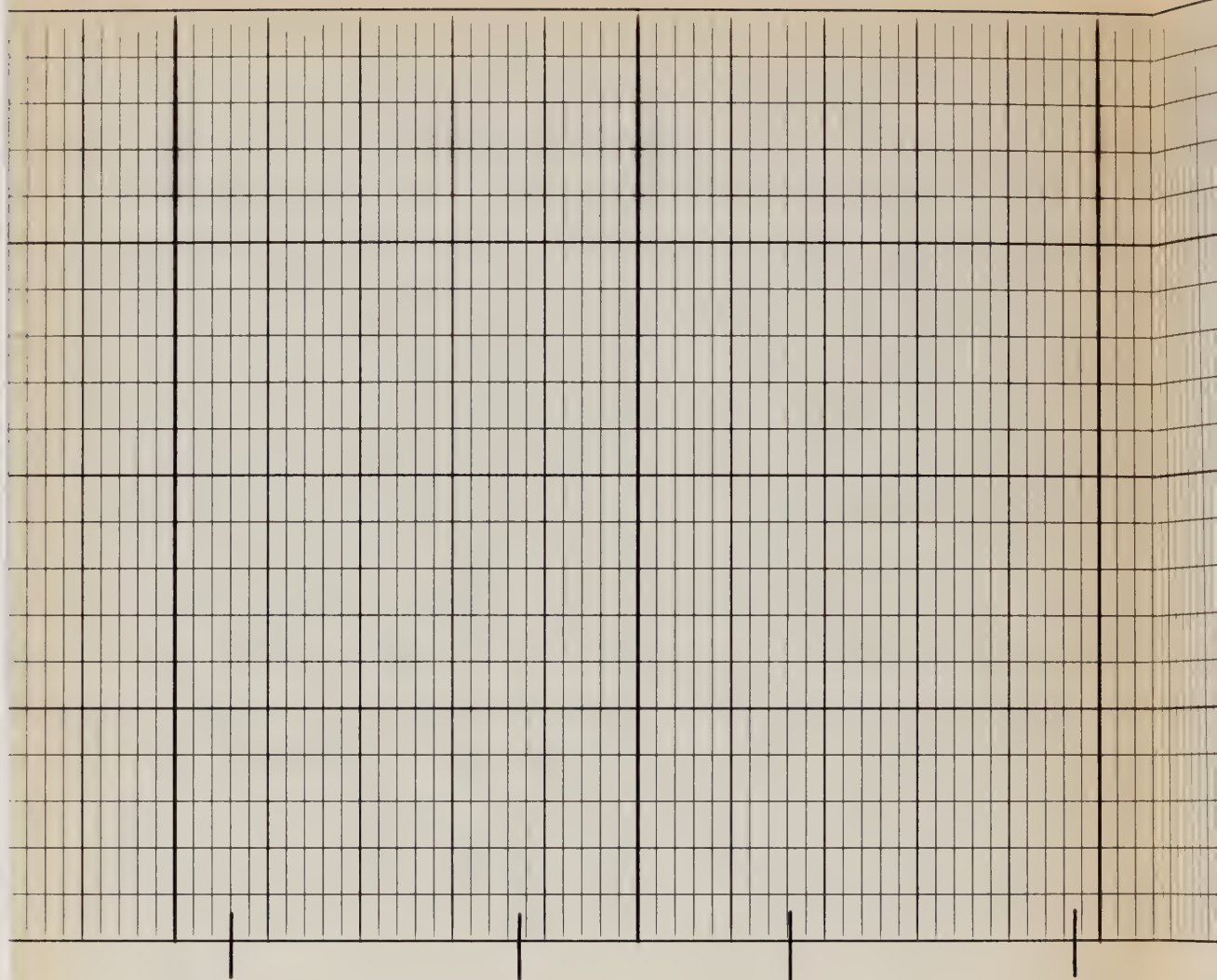
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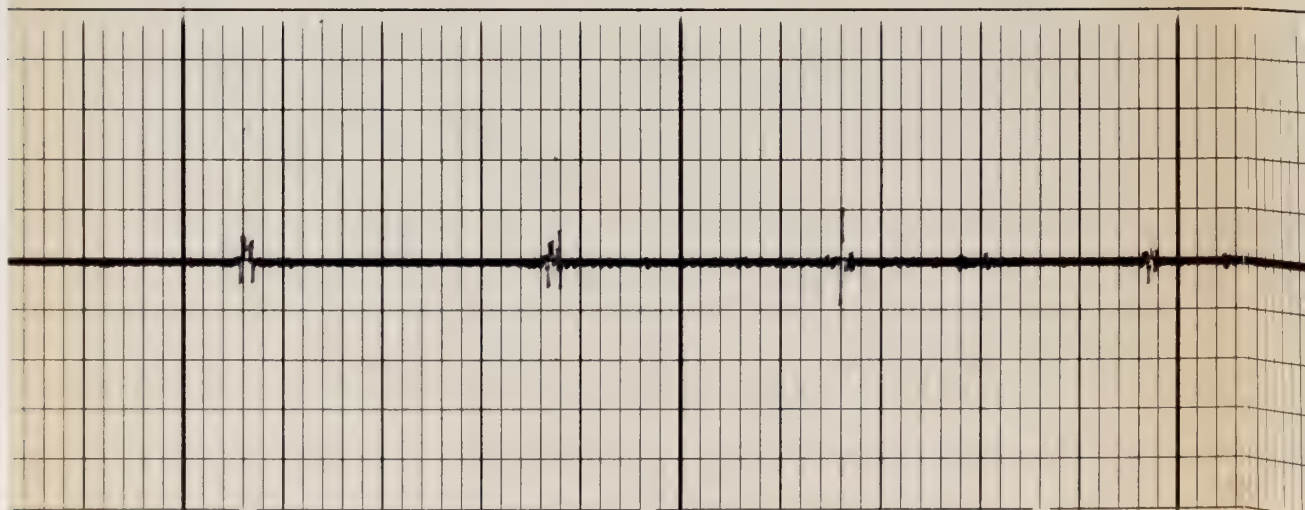
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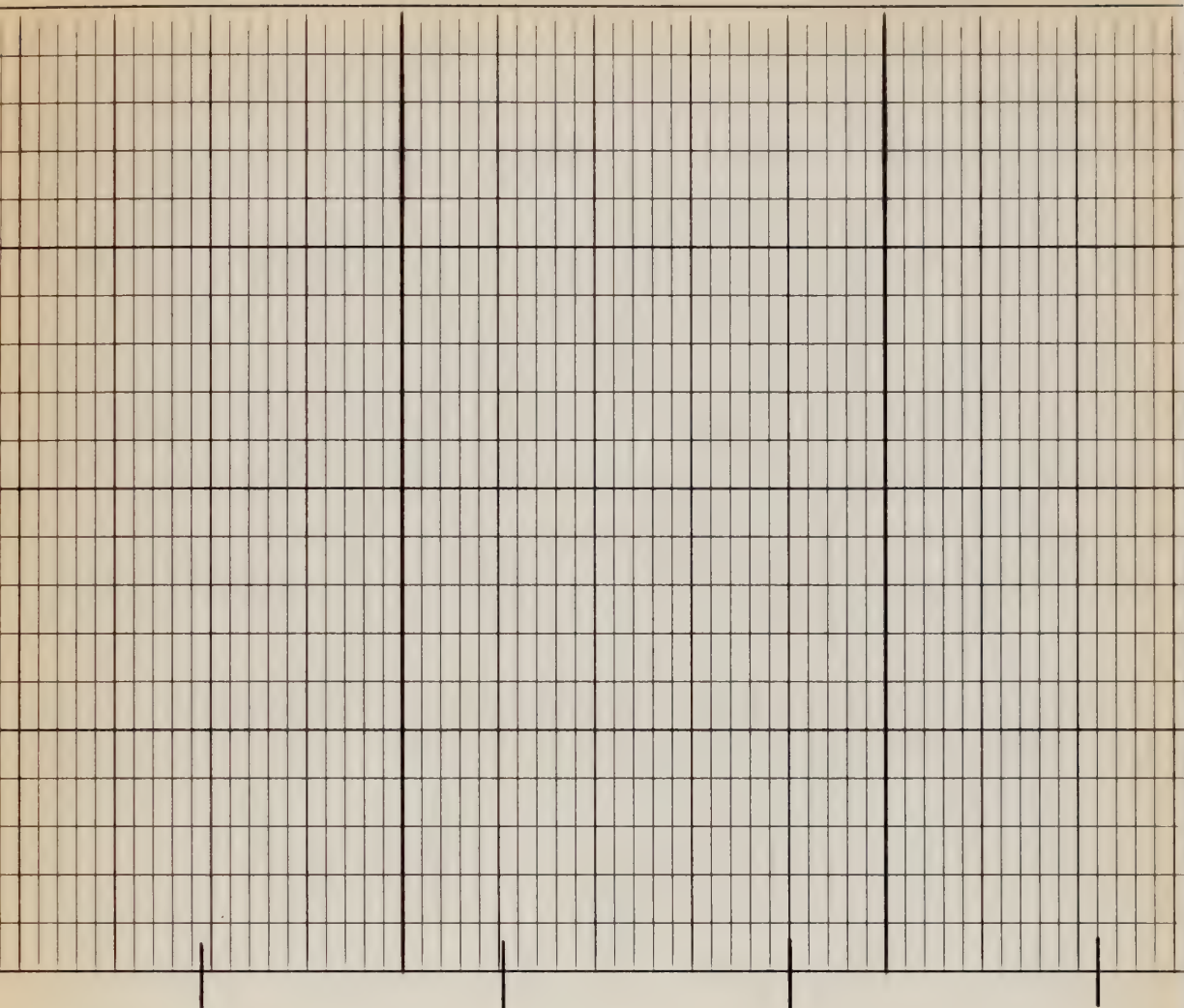




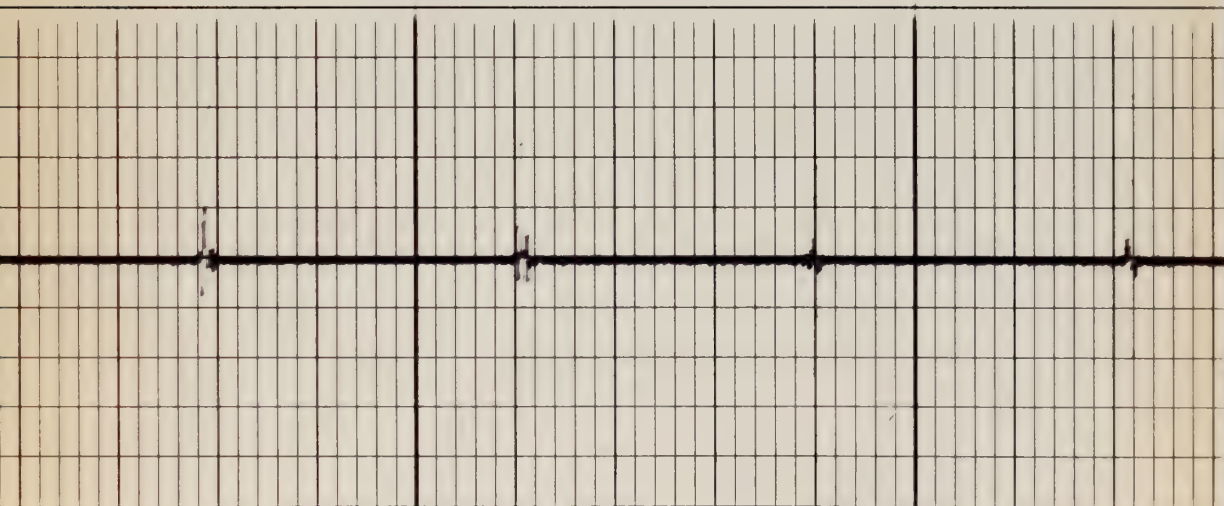
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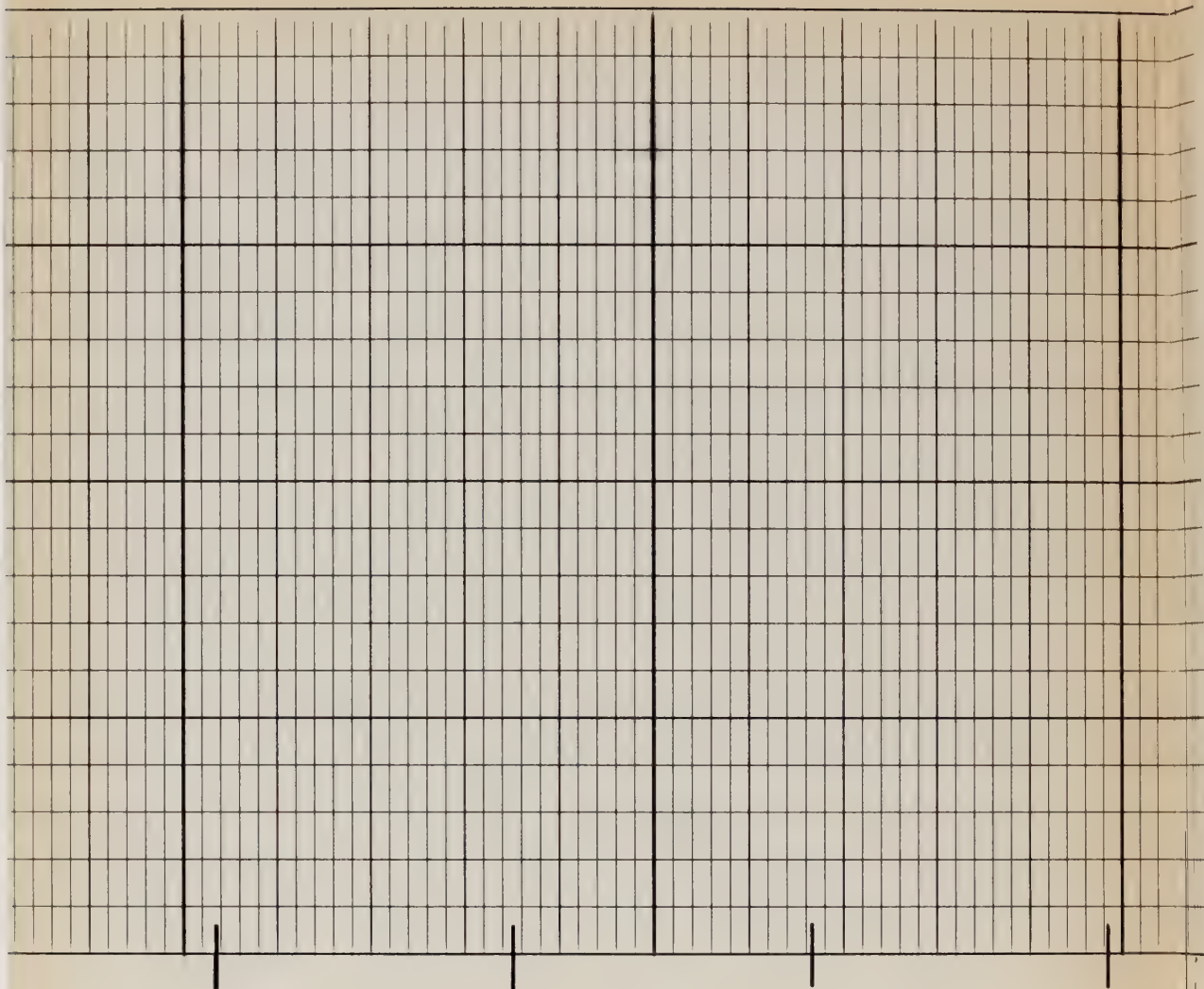
1900



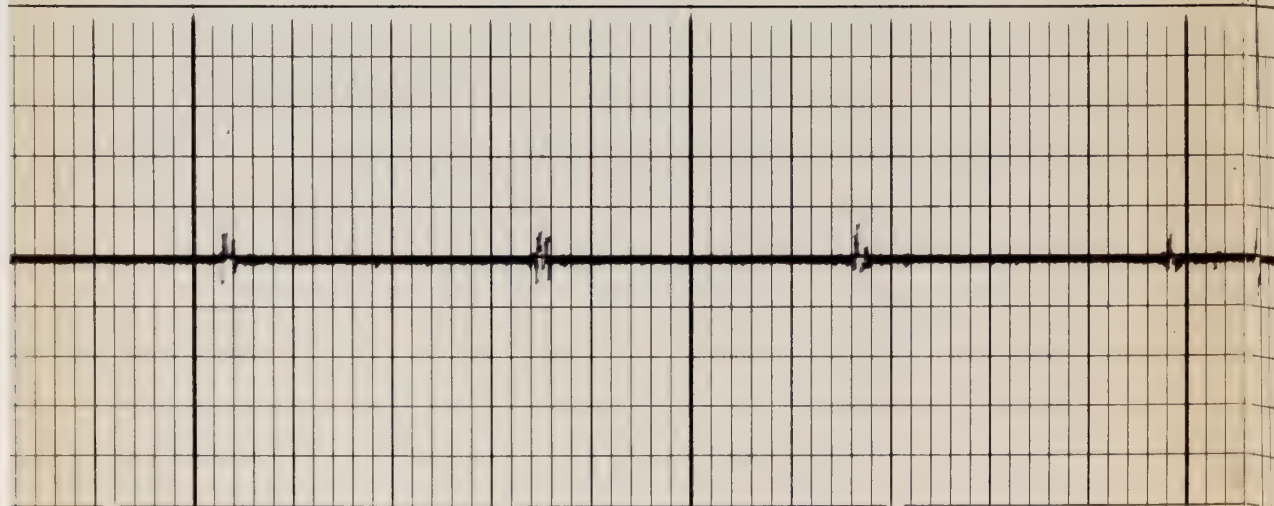


2000





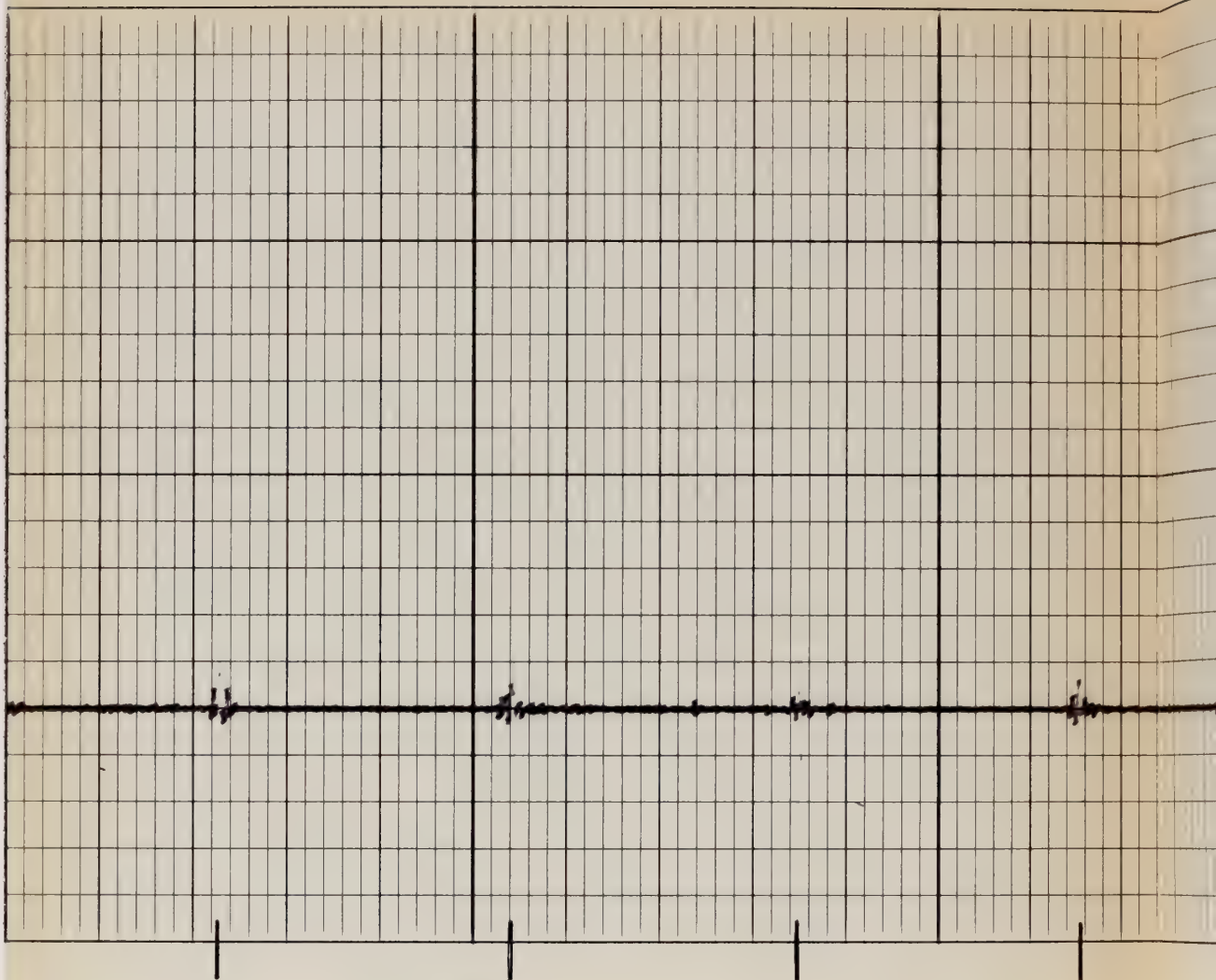
2100



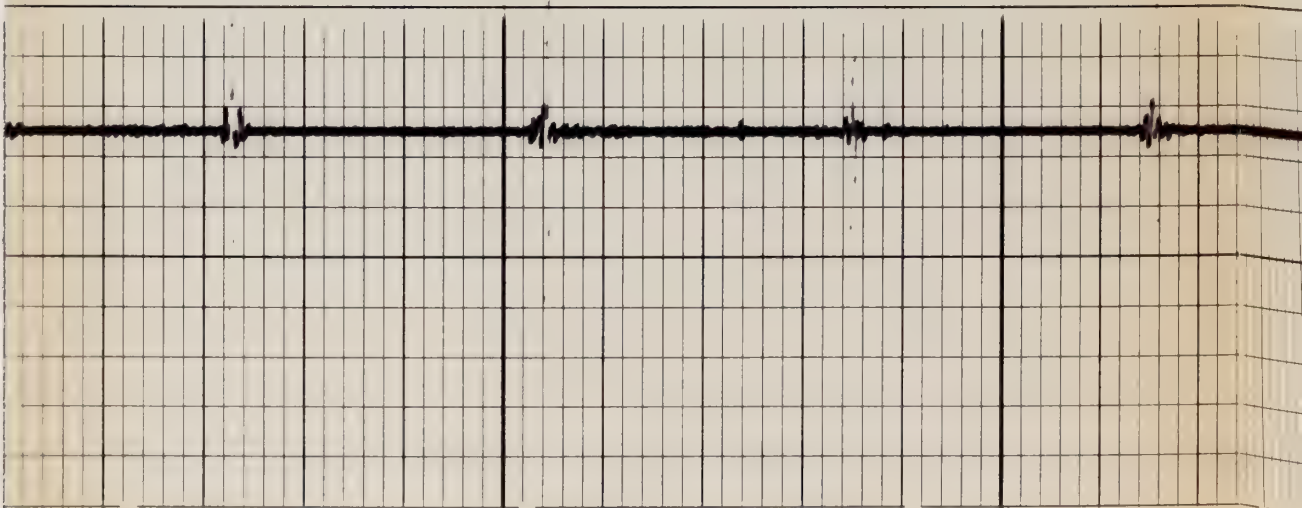
E. R.

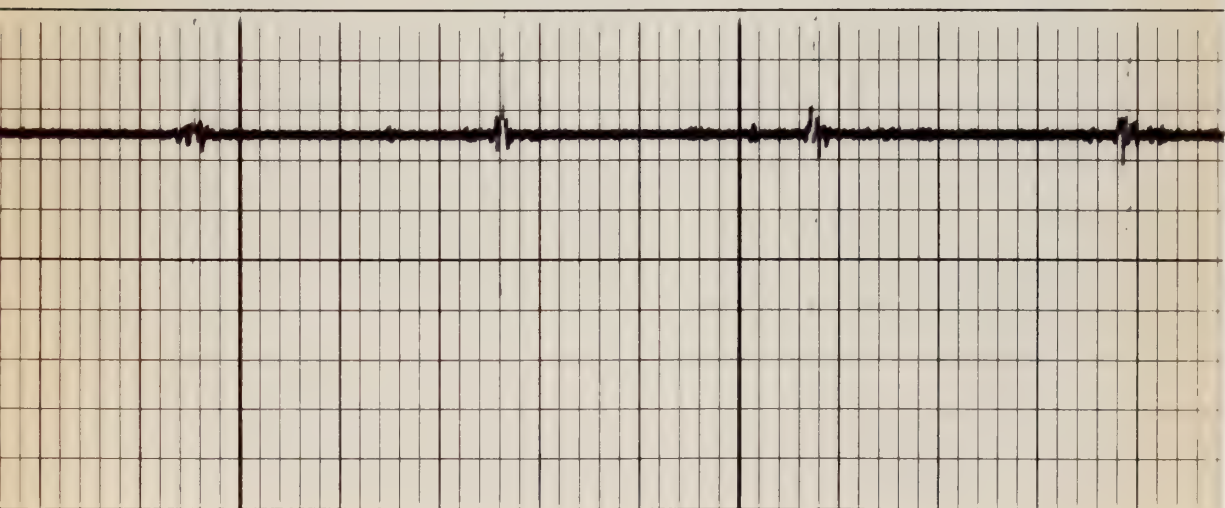
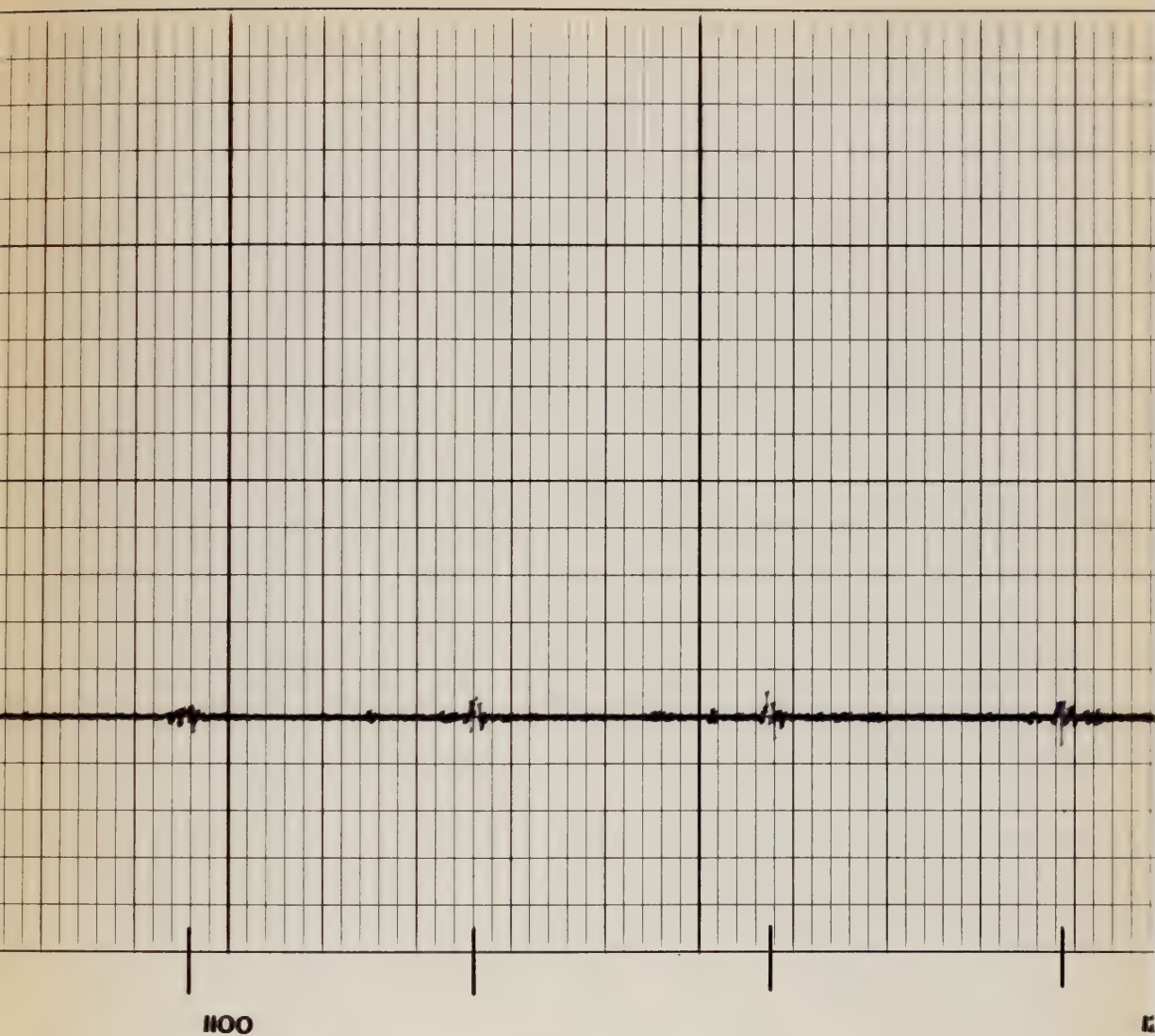
A diagram illustrating a vertical line with several horizontal segments extending from it at different heights. The segments are labeled with numbers 1 through 6. The labels are placed to the right of the line.

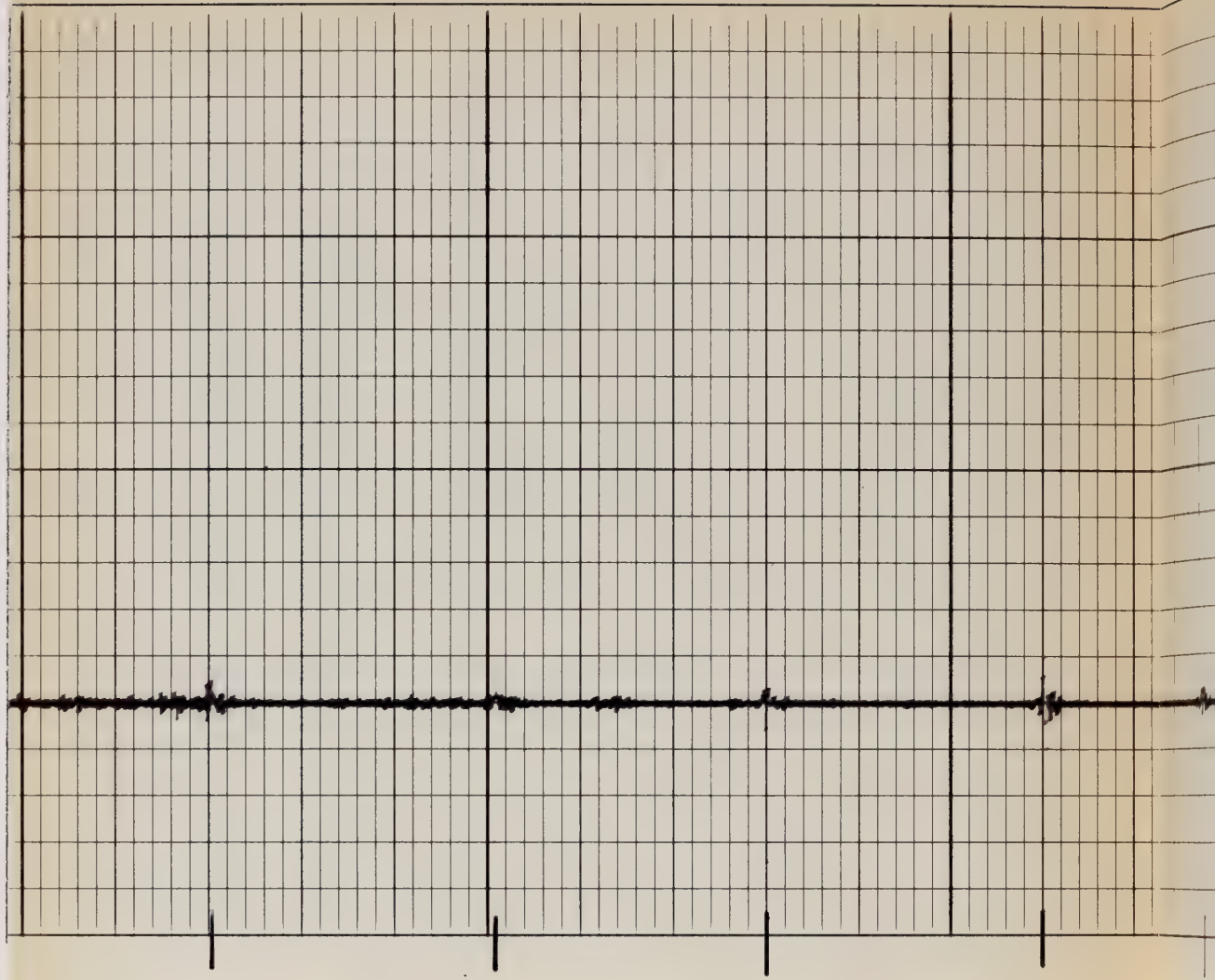
0900



1000

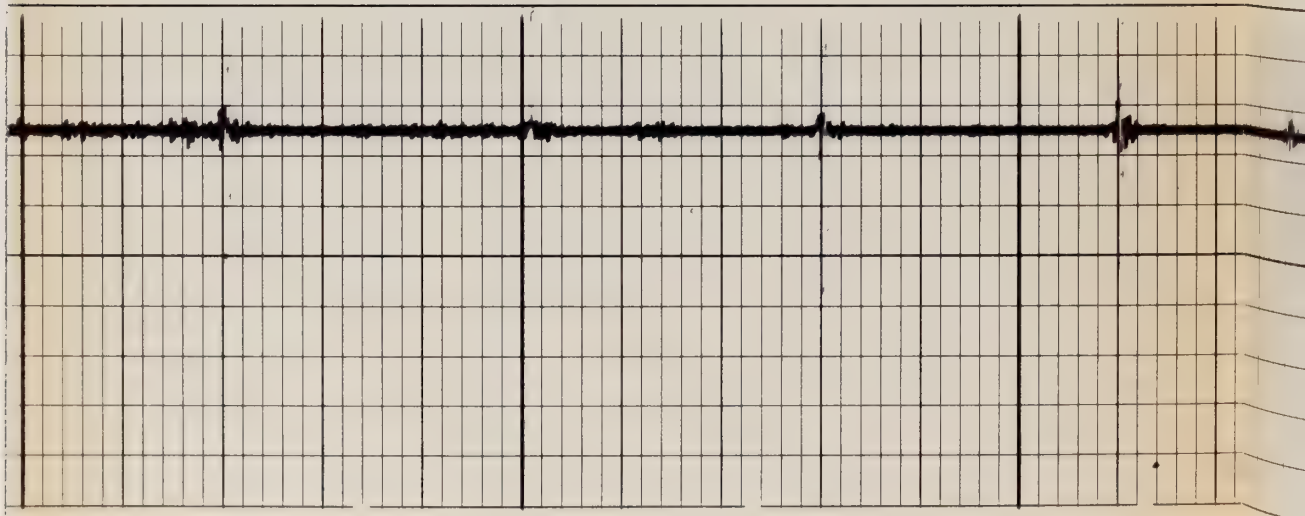


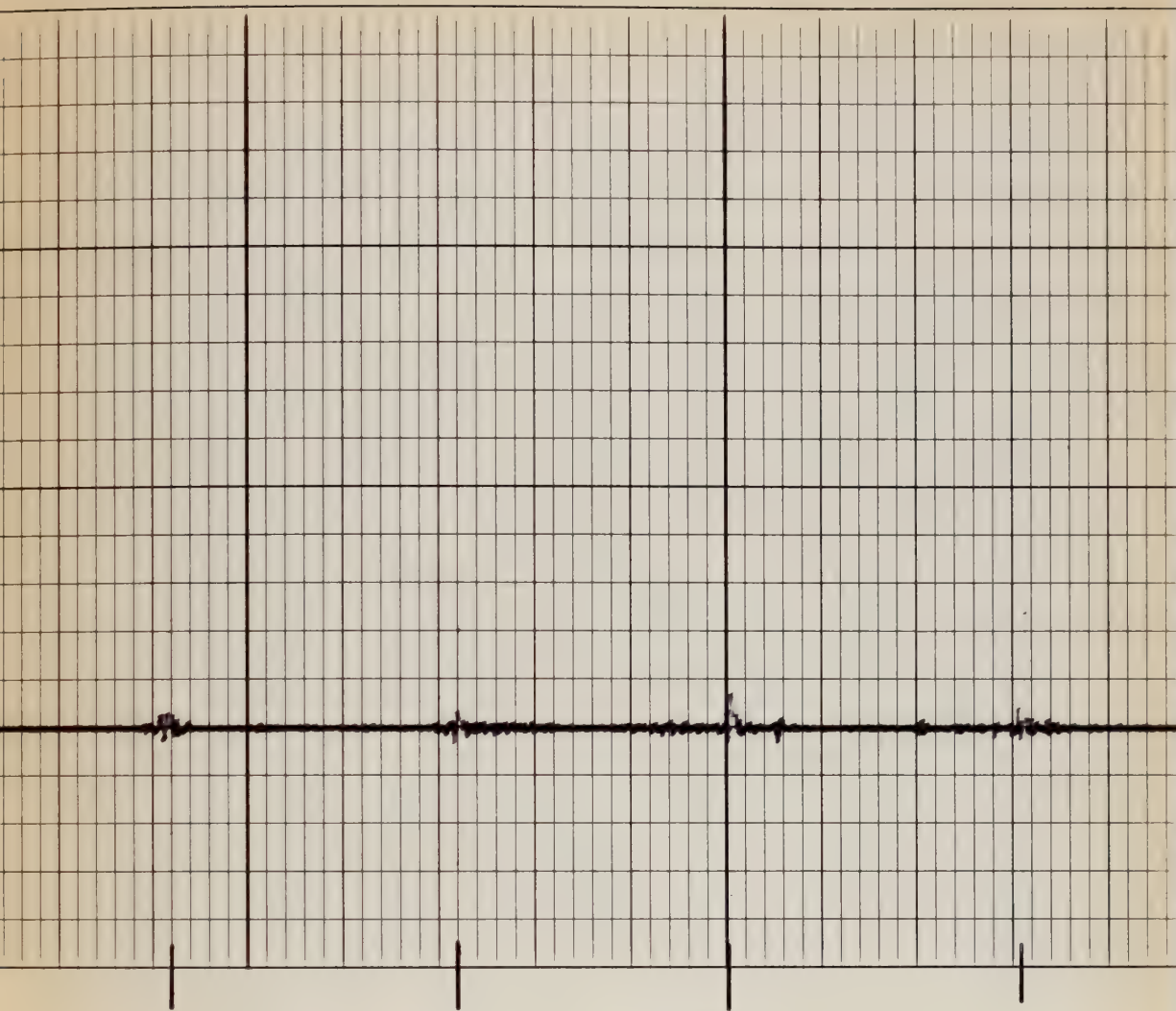




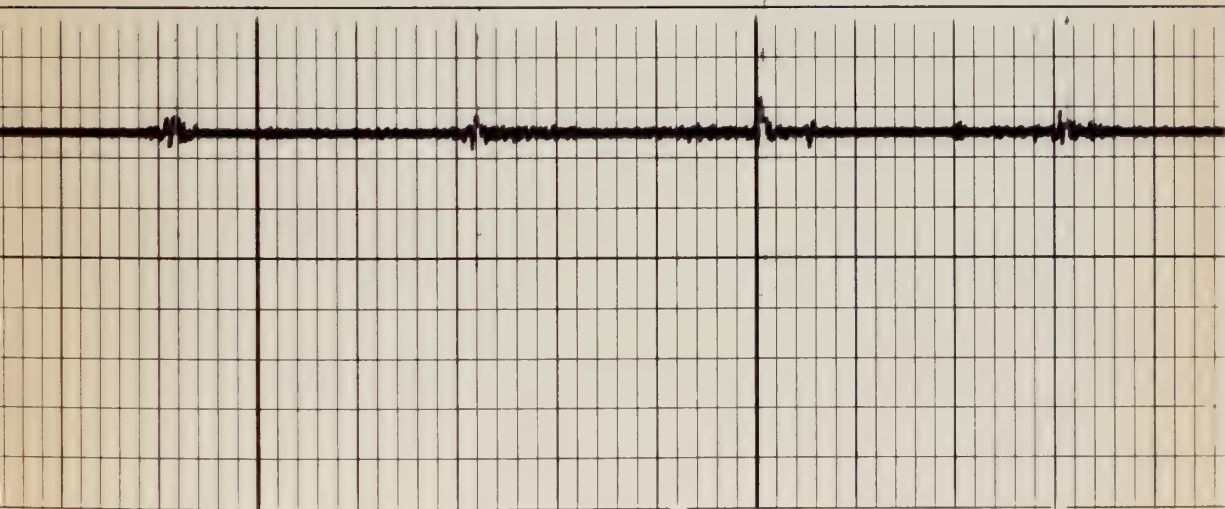
200

300



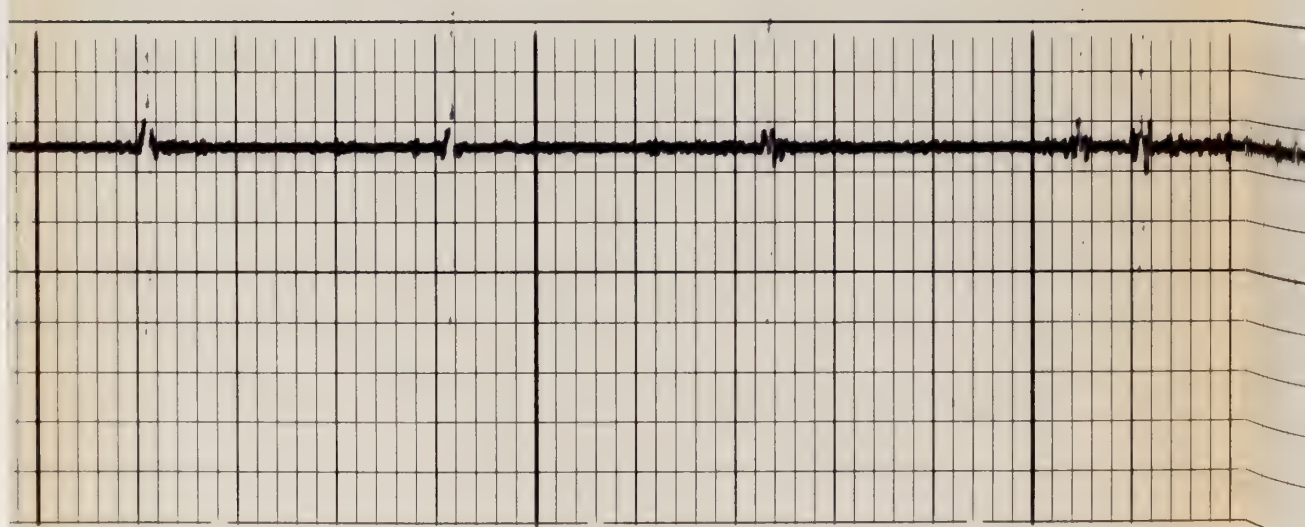


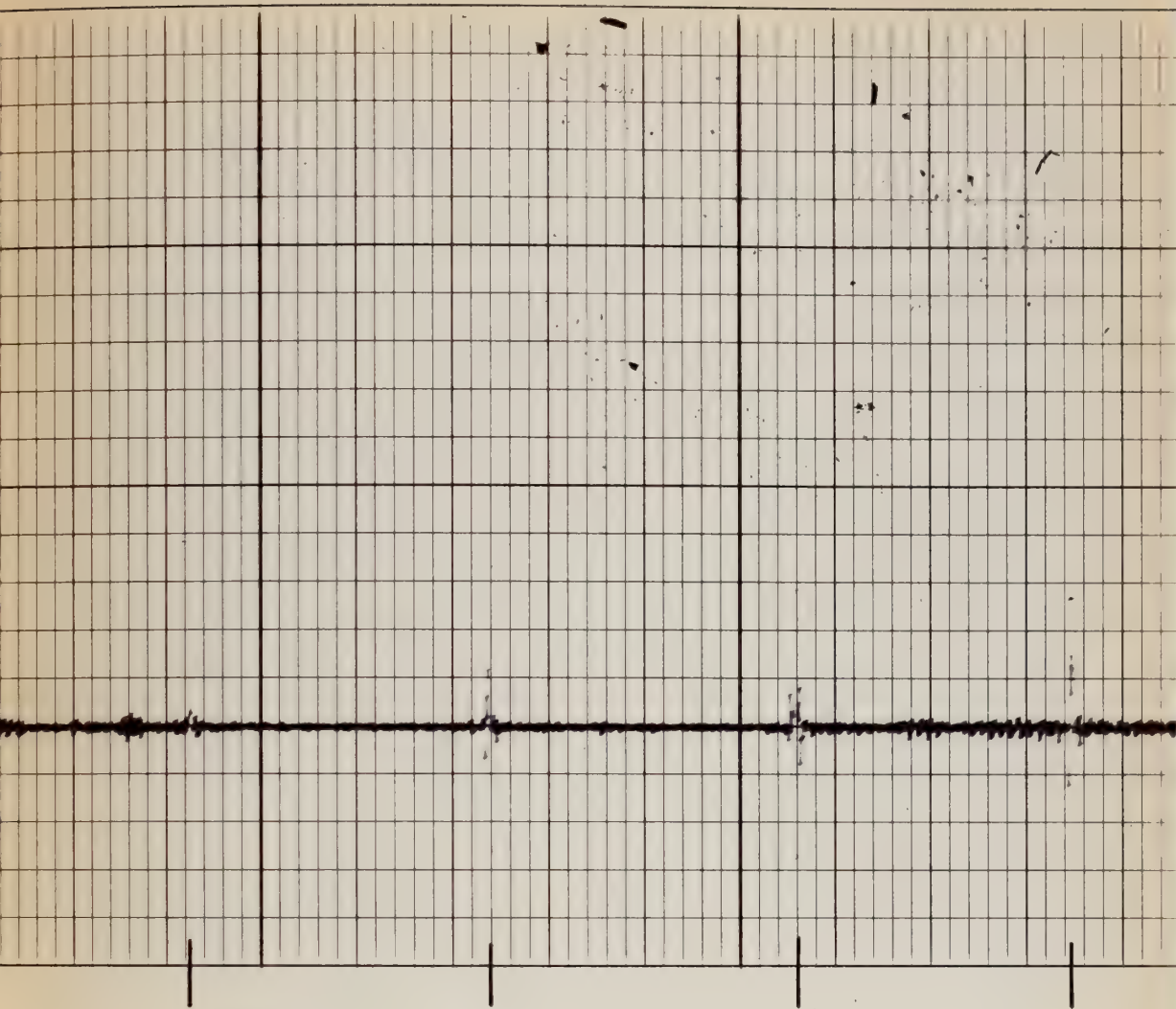
1400



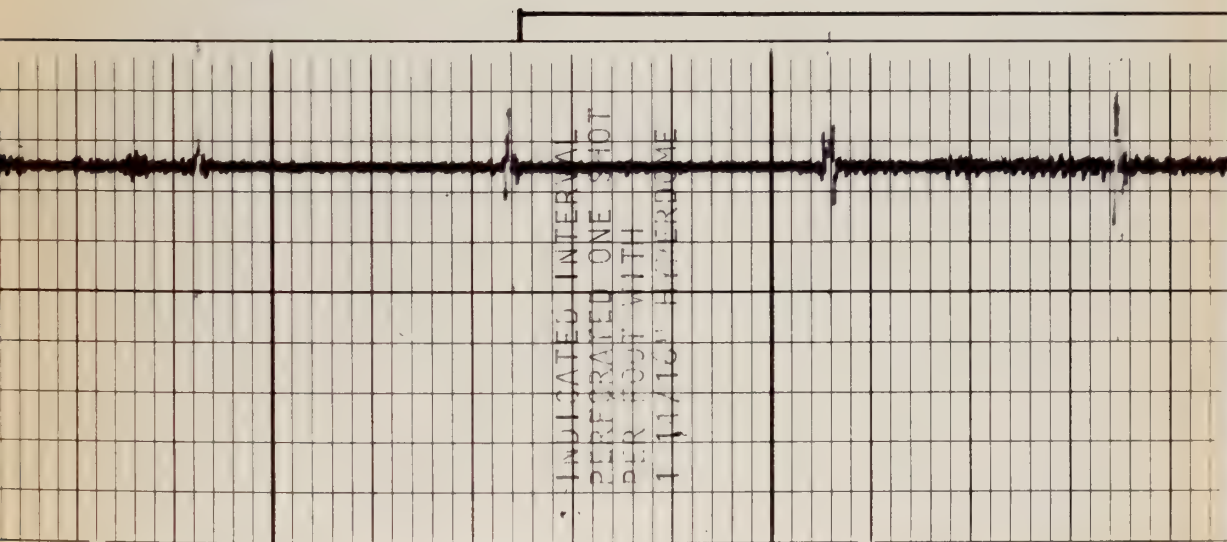


1500

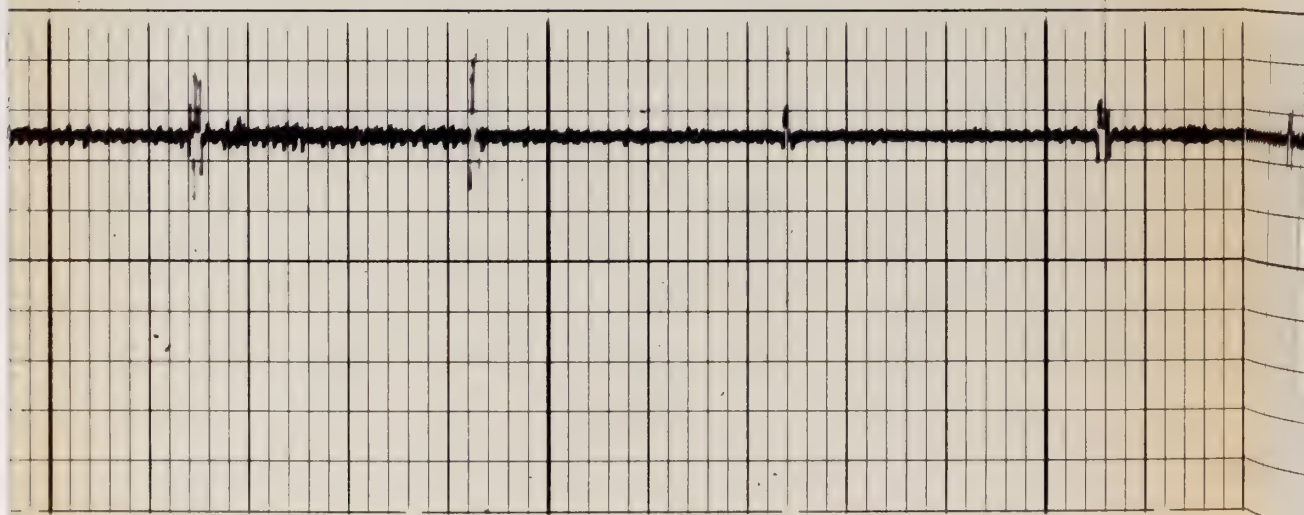
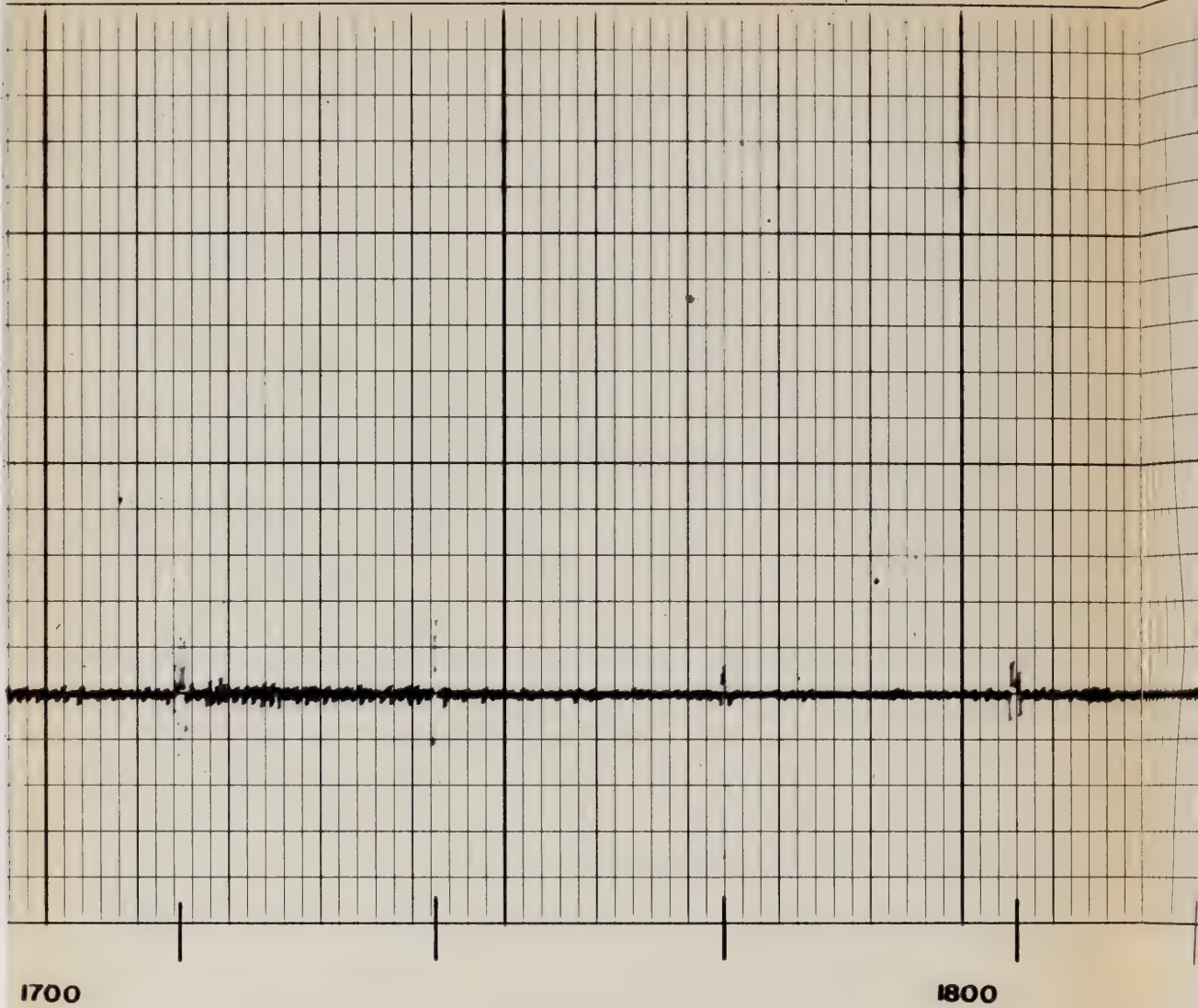


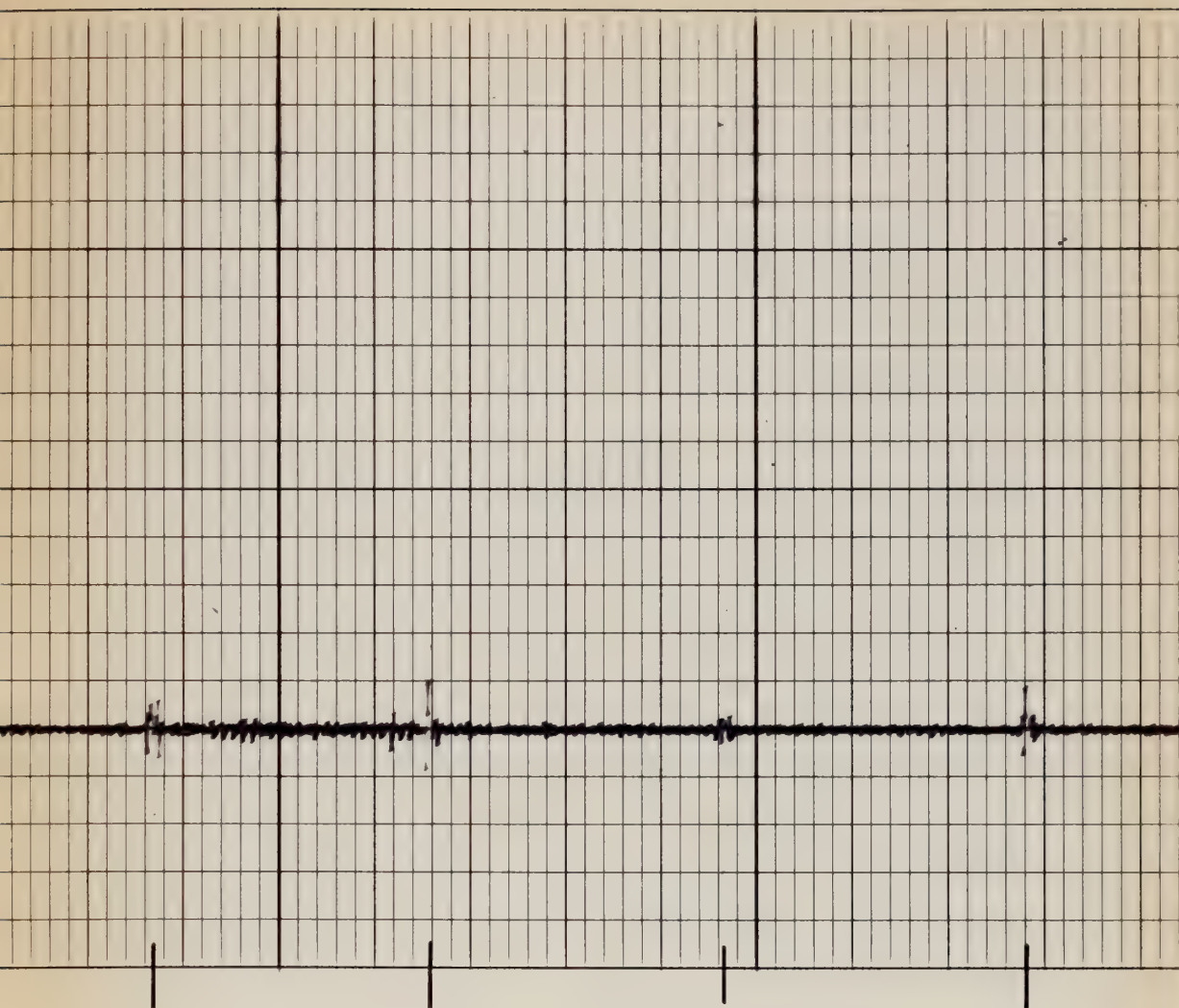


1600

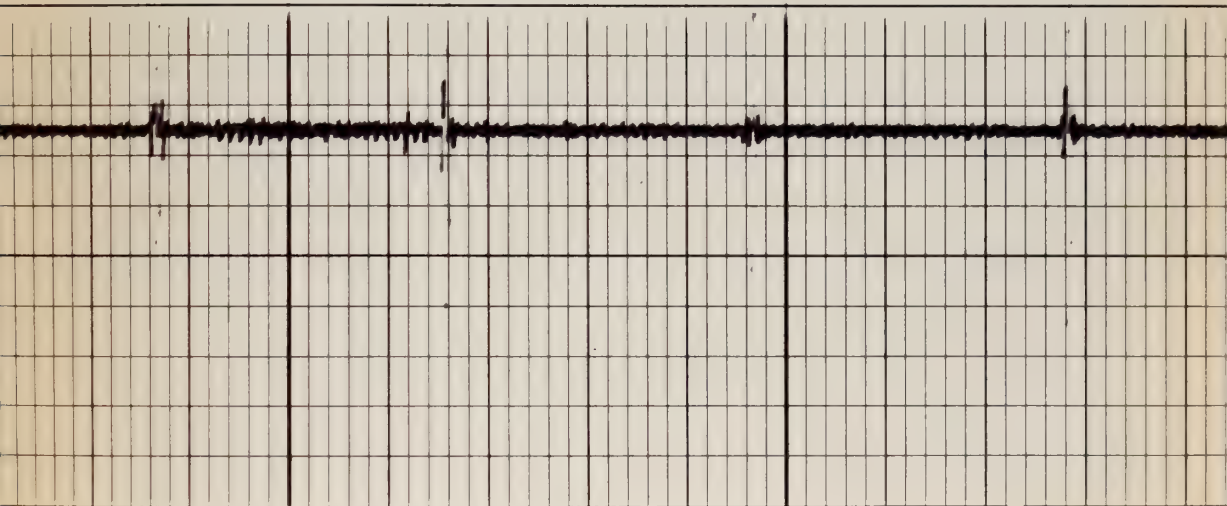


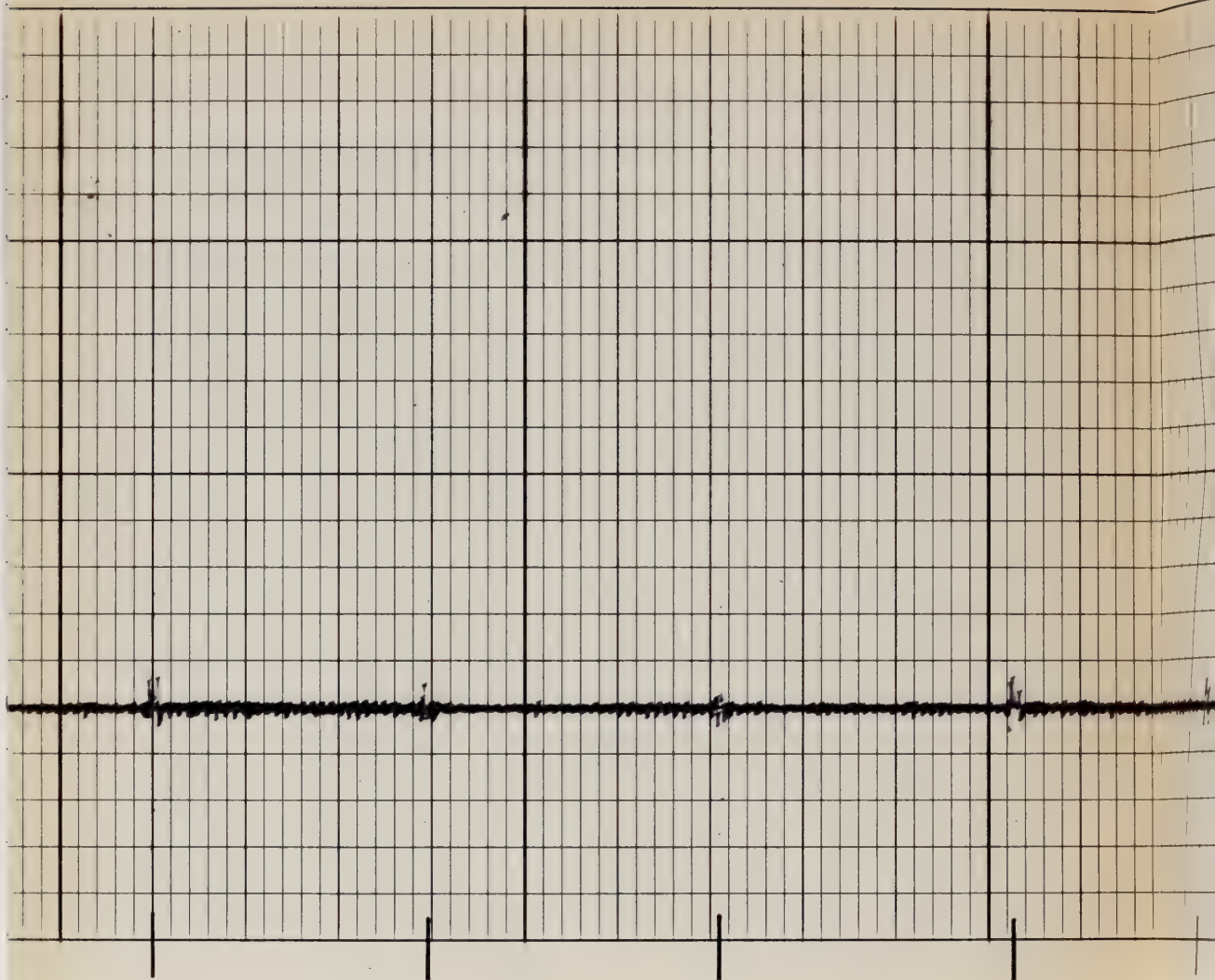
INDICATED INTERVAL
PREPARED ONE SHOT
PER FOOT WITH
1 11/16 HYPERSOME



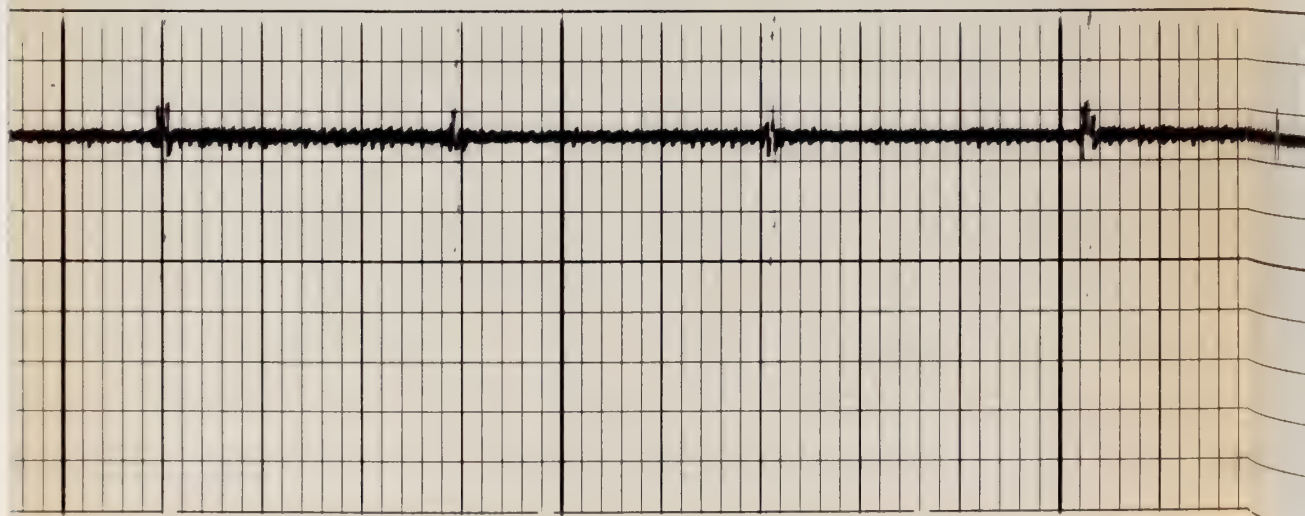


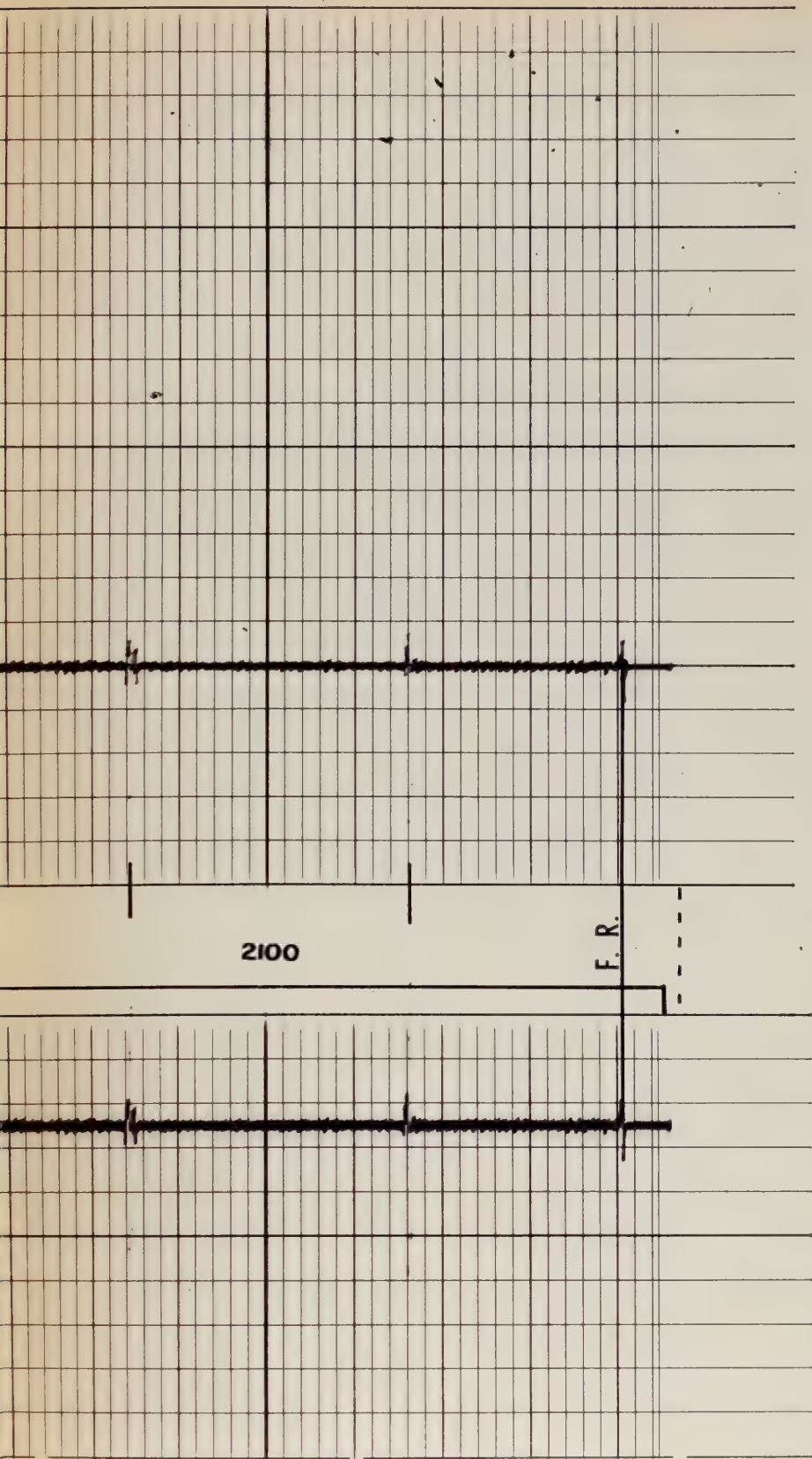
1900



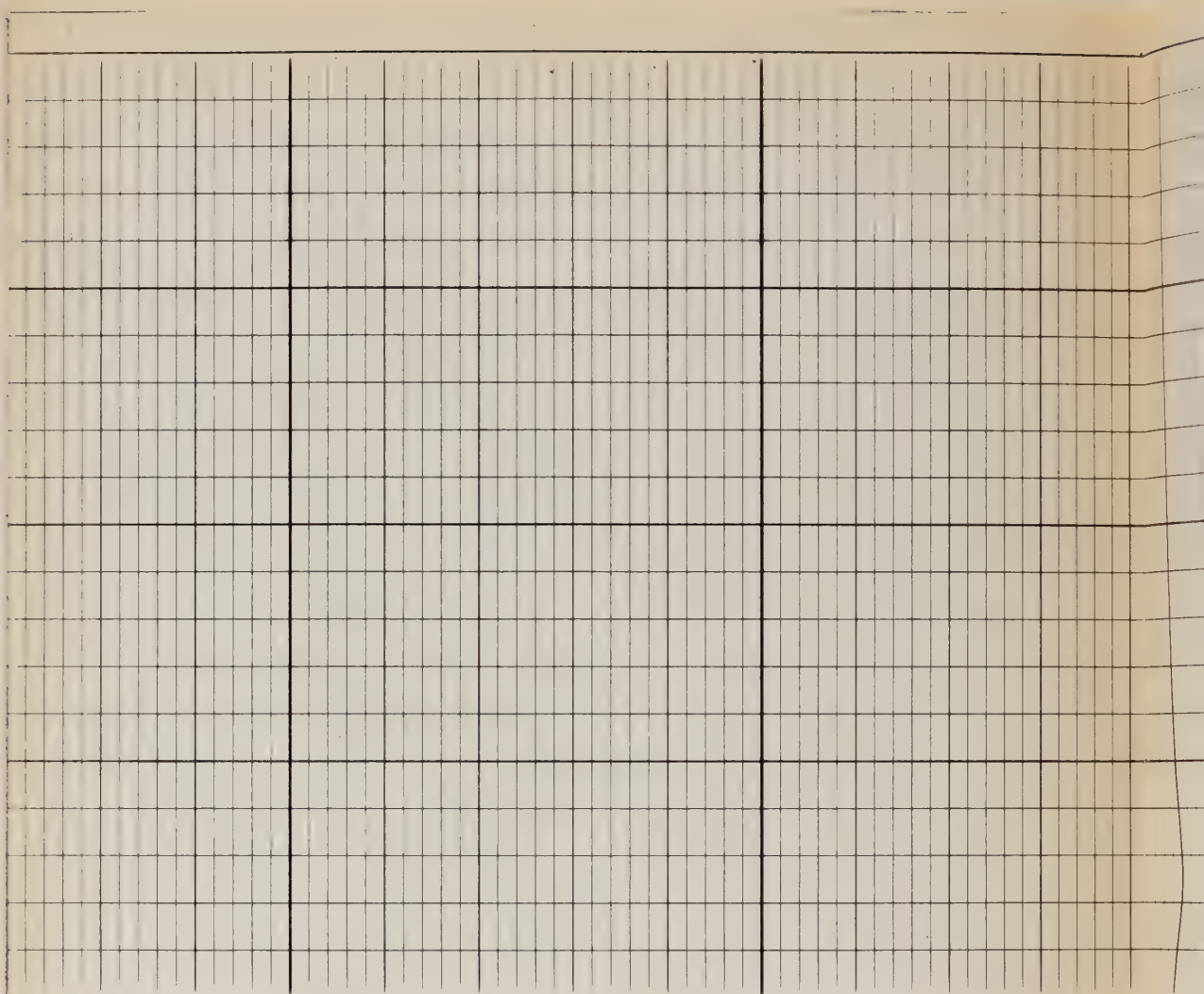


2000

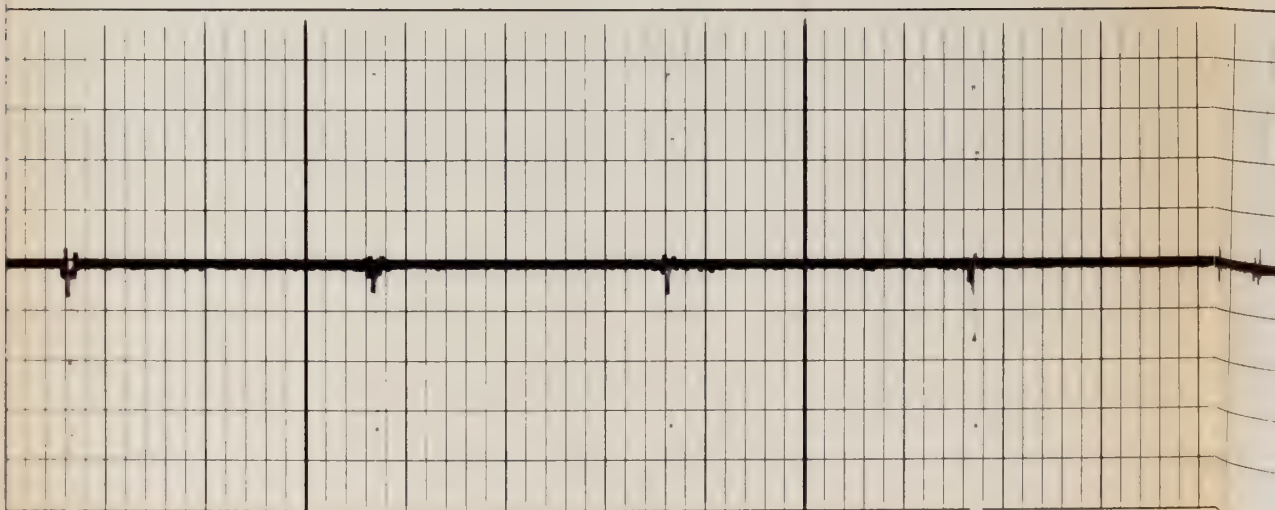


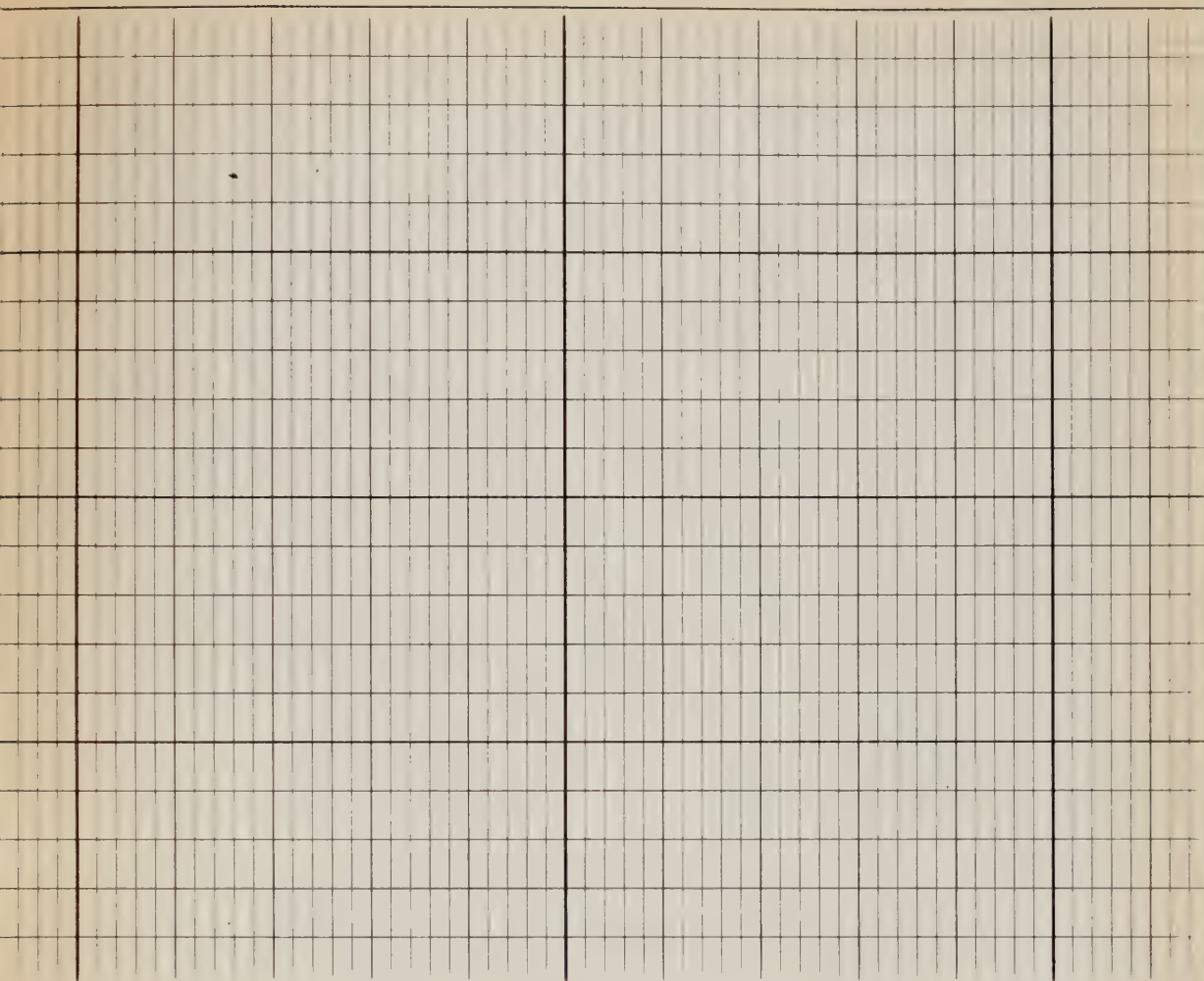


NO. 2-MIDDLE STRING-COLLAR LOG RUN BEFORE PERFORATING

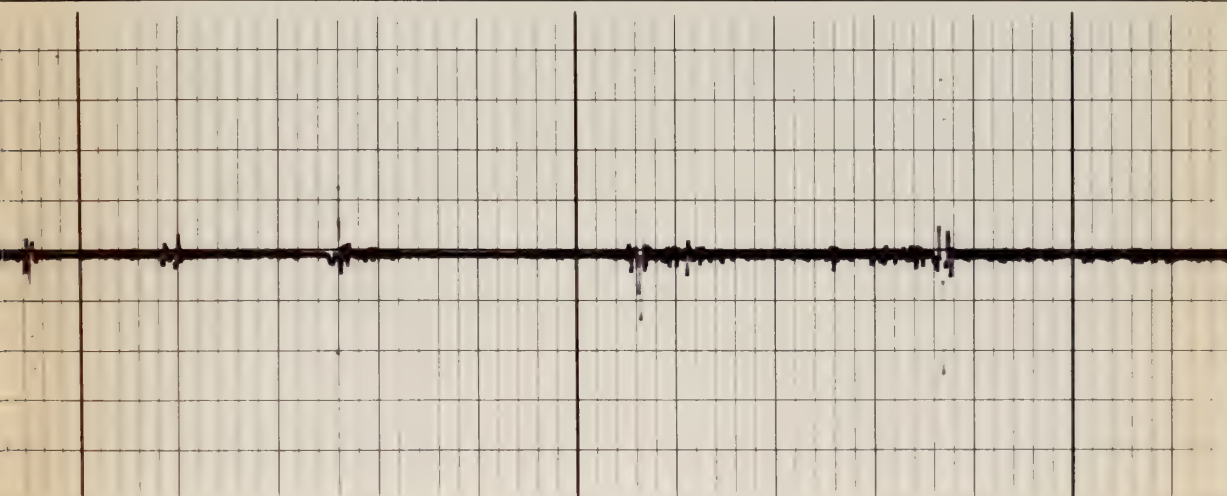


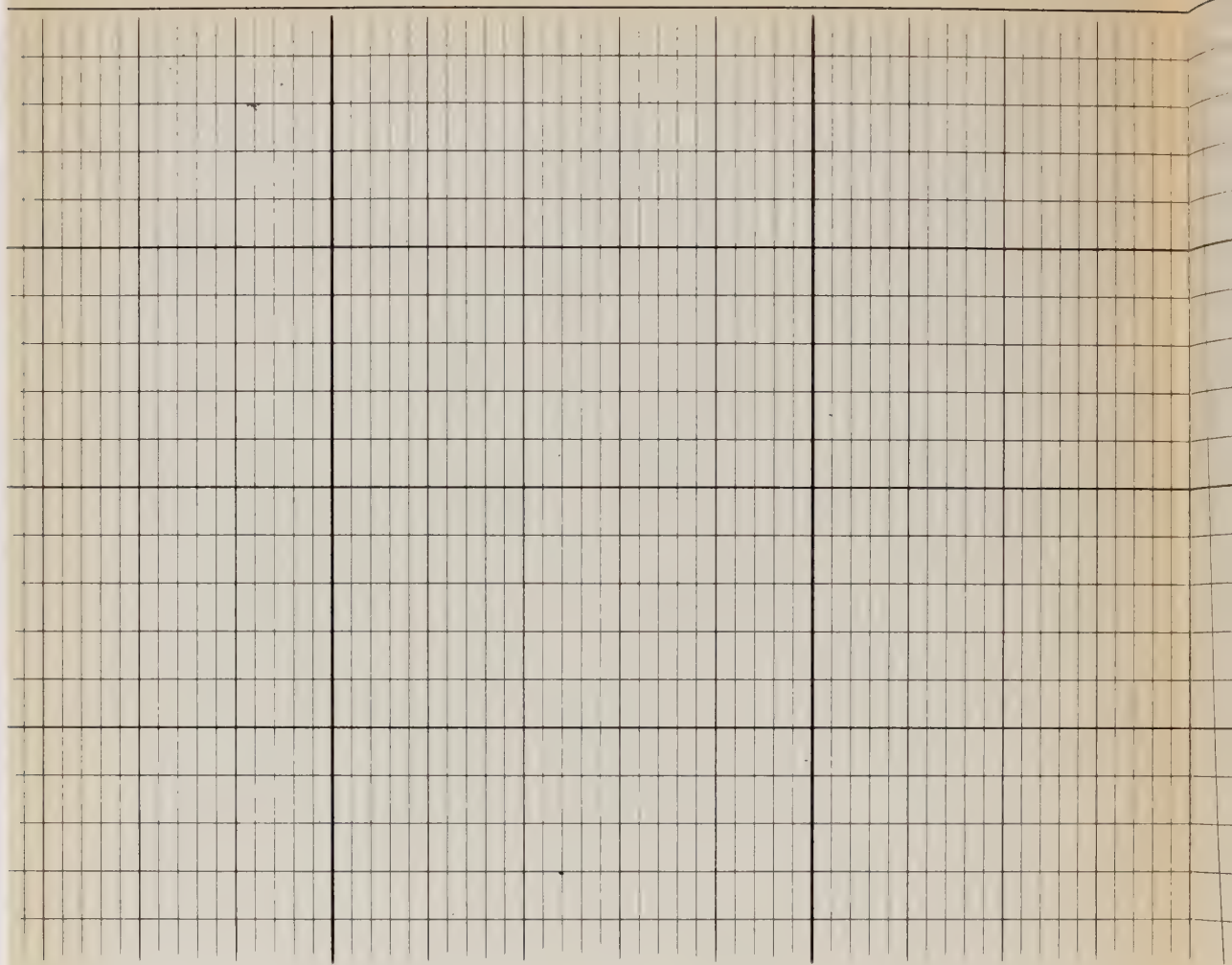
1000



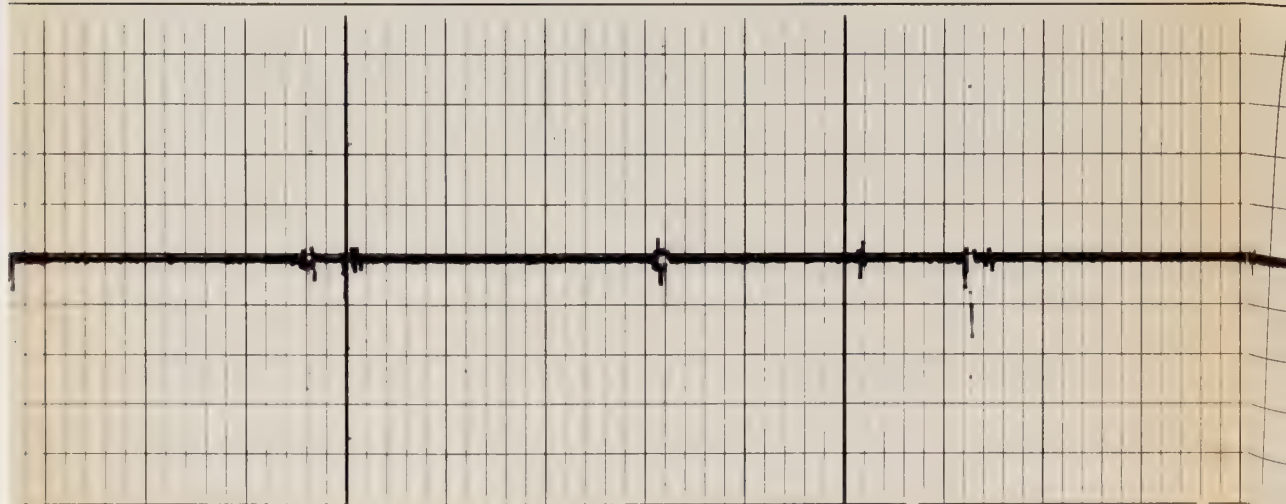


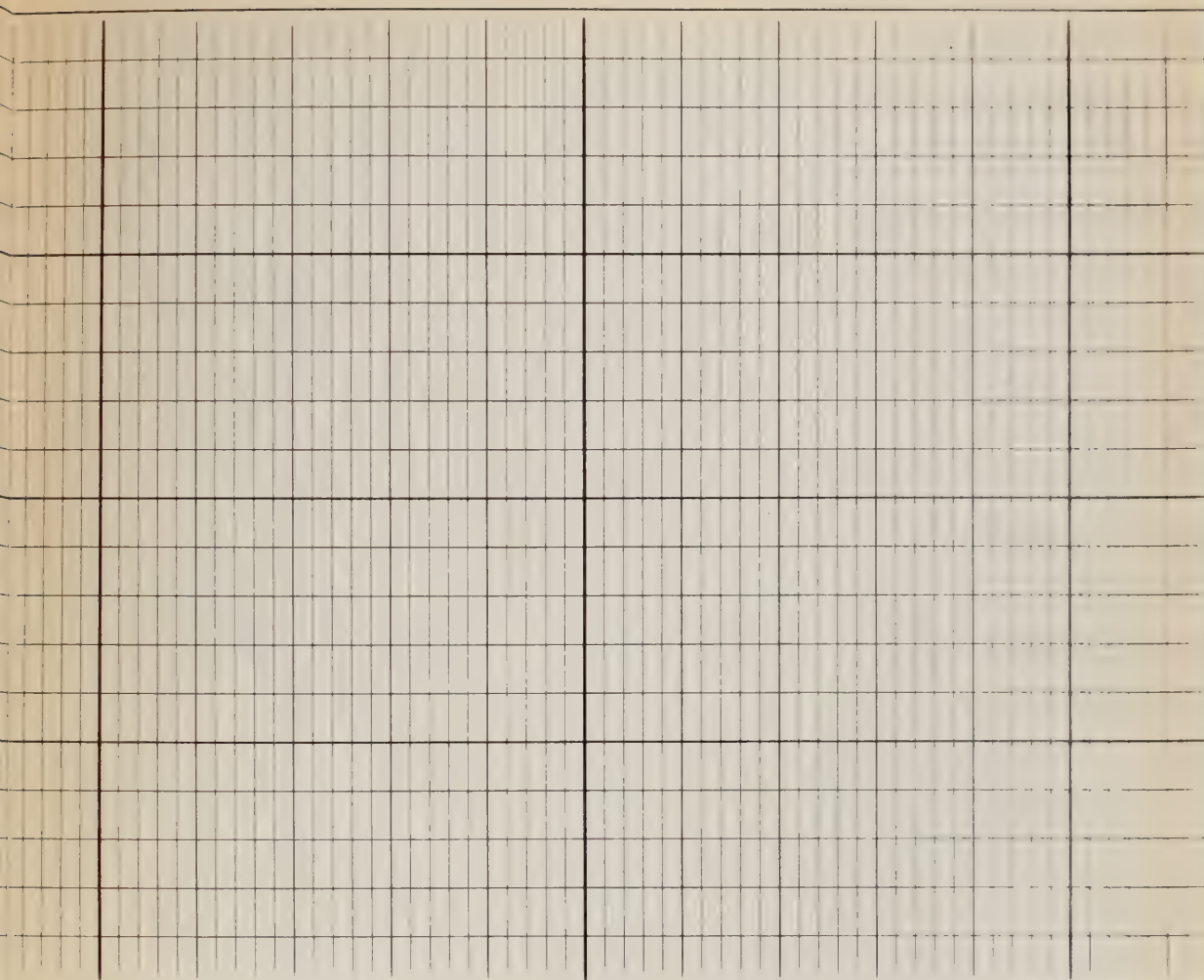
1100





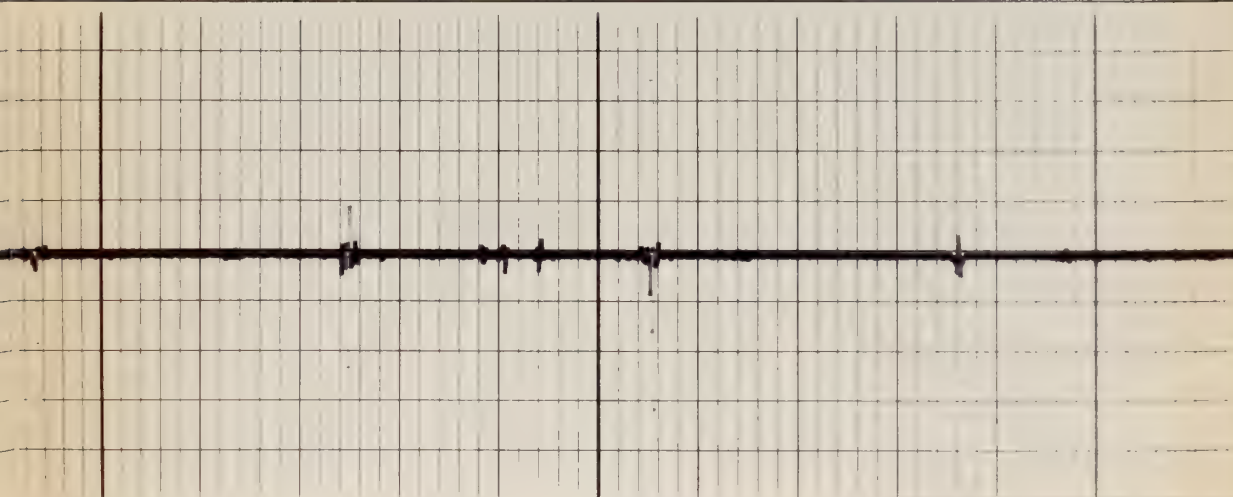
1200

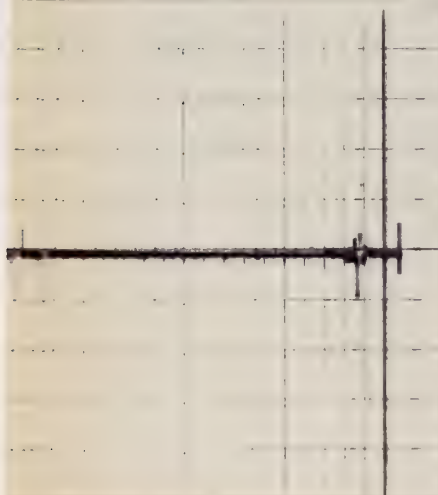




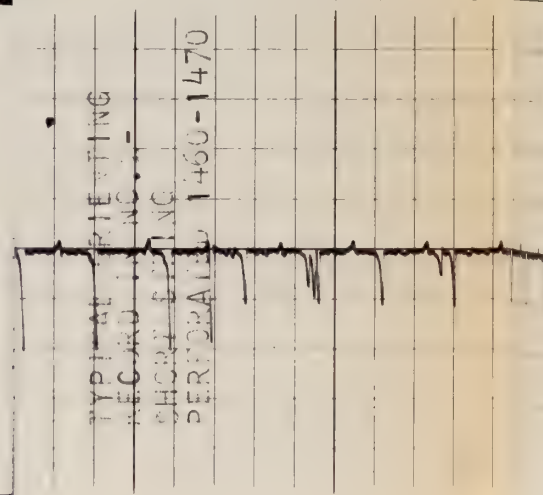
1300

1400

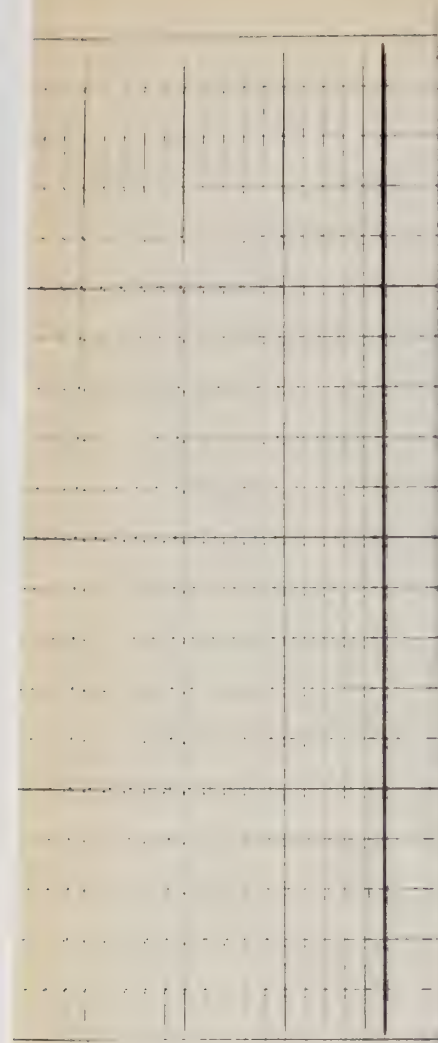




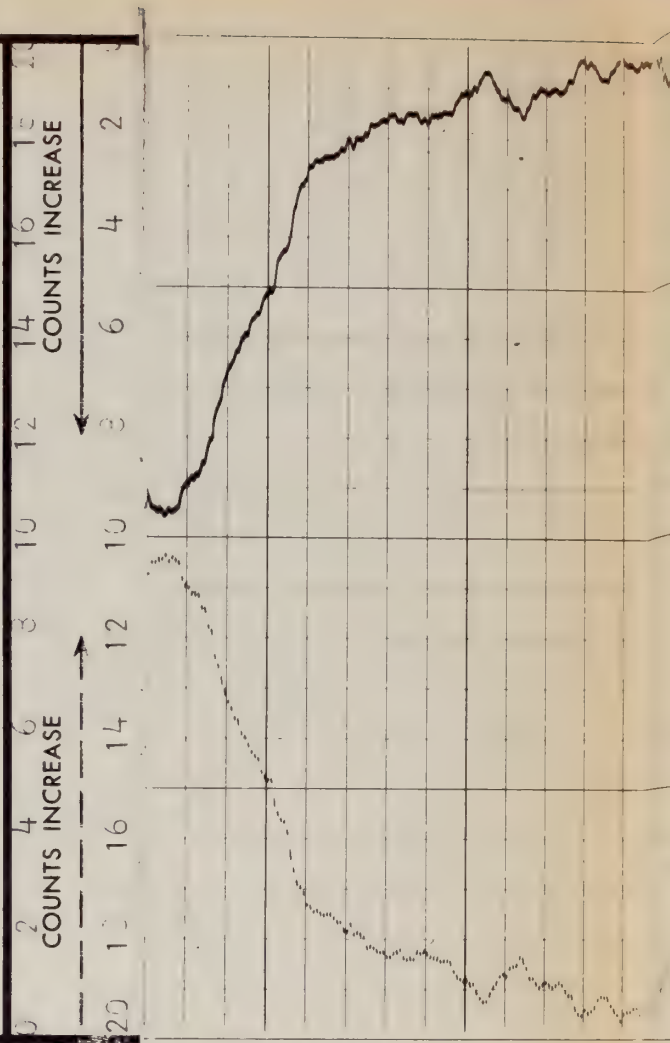
INDEXING
RECORD



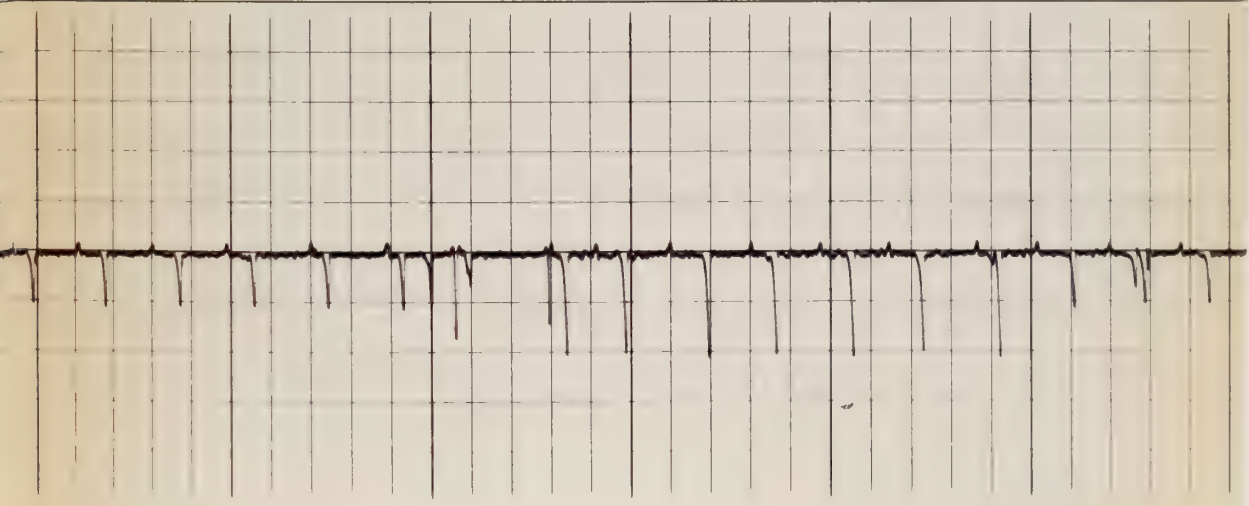
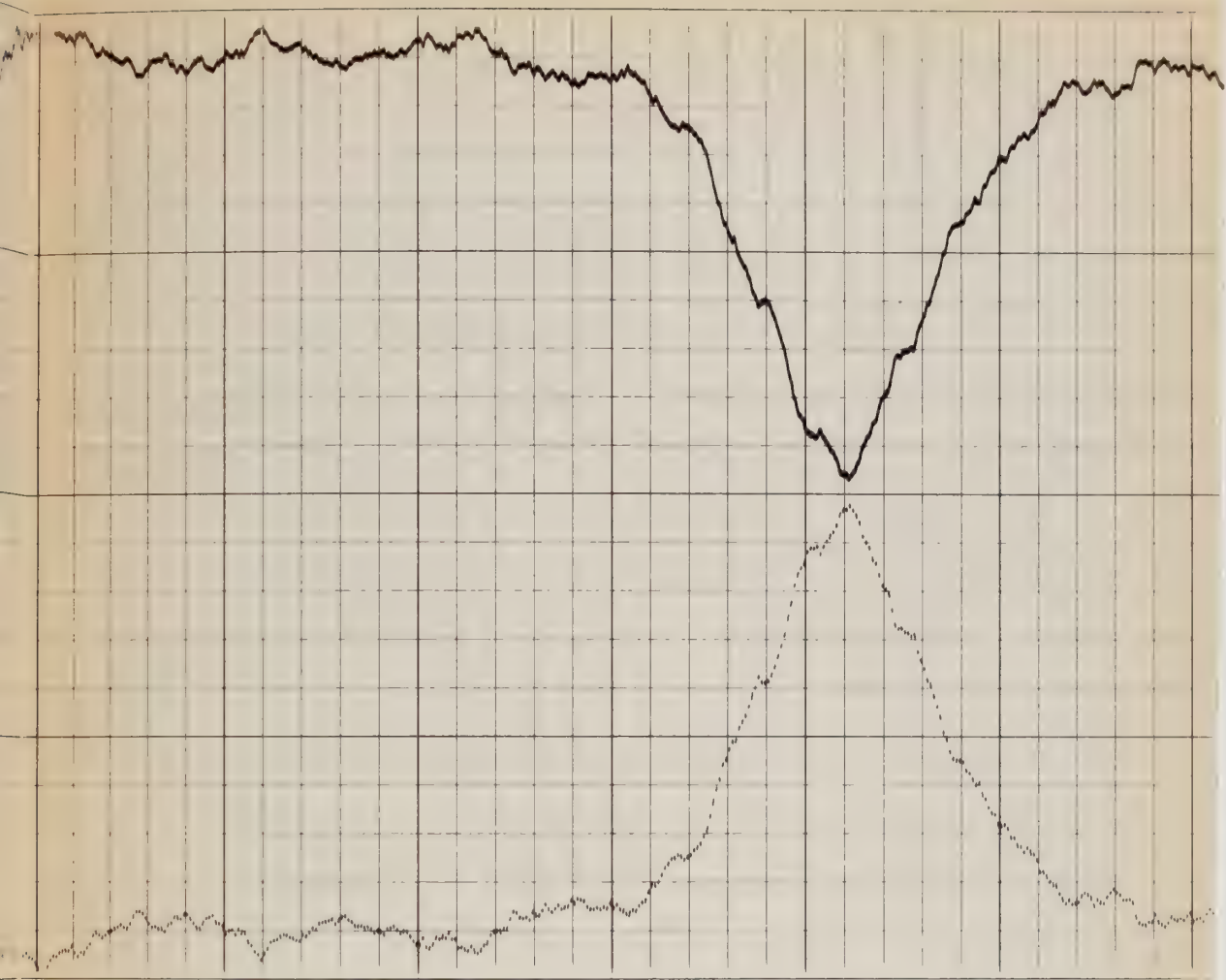
TYPICAL ORIENTING
RECORDING
CHROMATOPHORE
PERFORATED 1460-1470

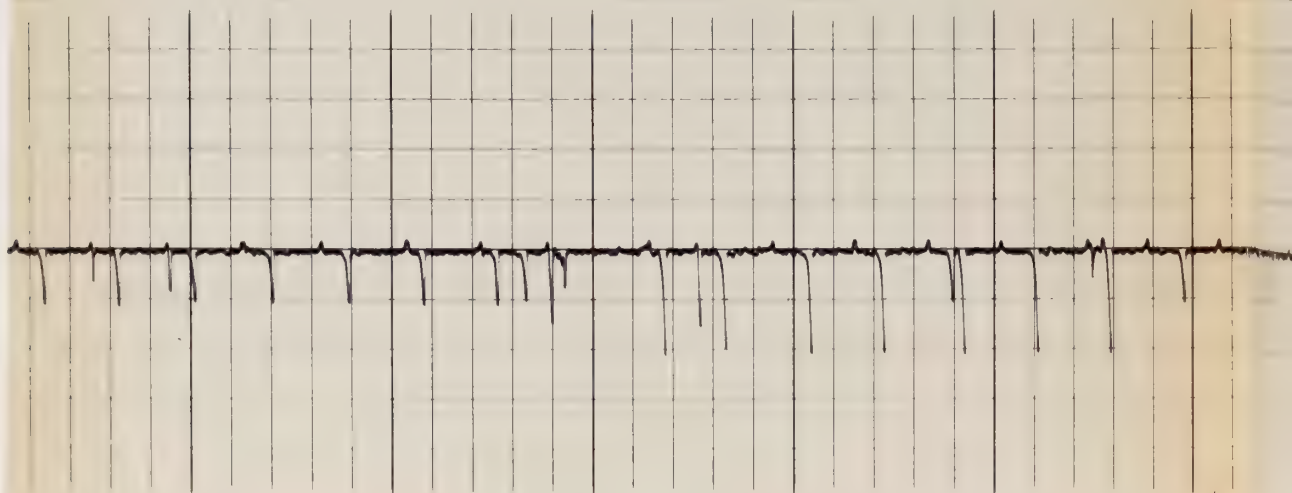
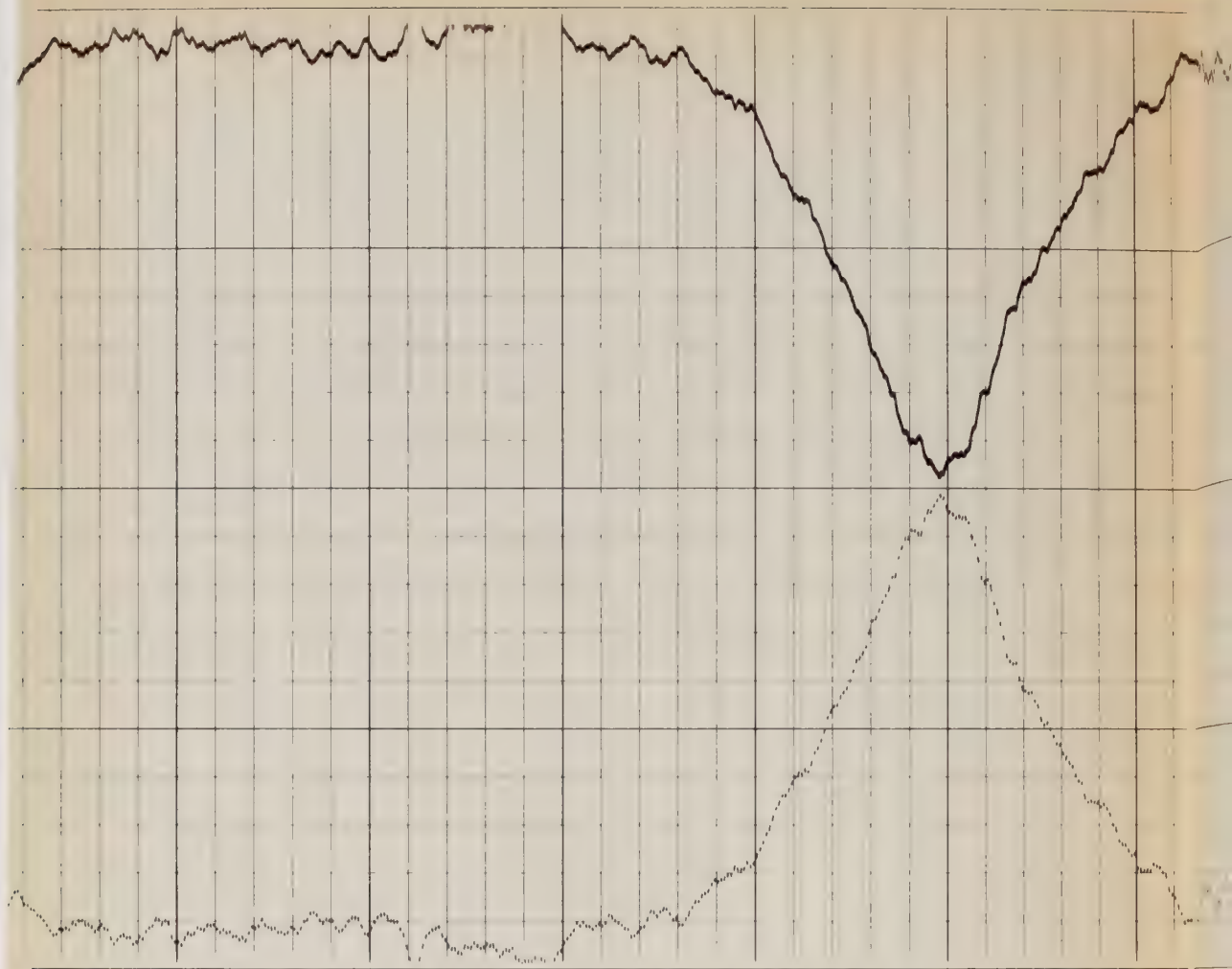


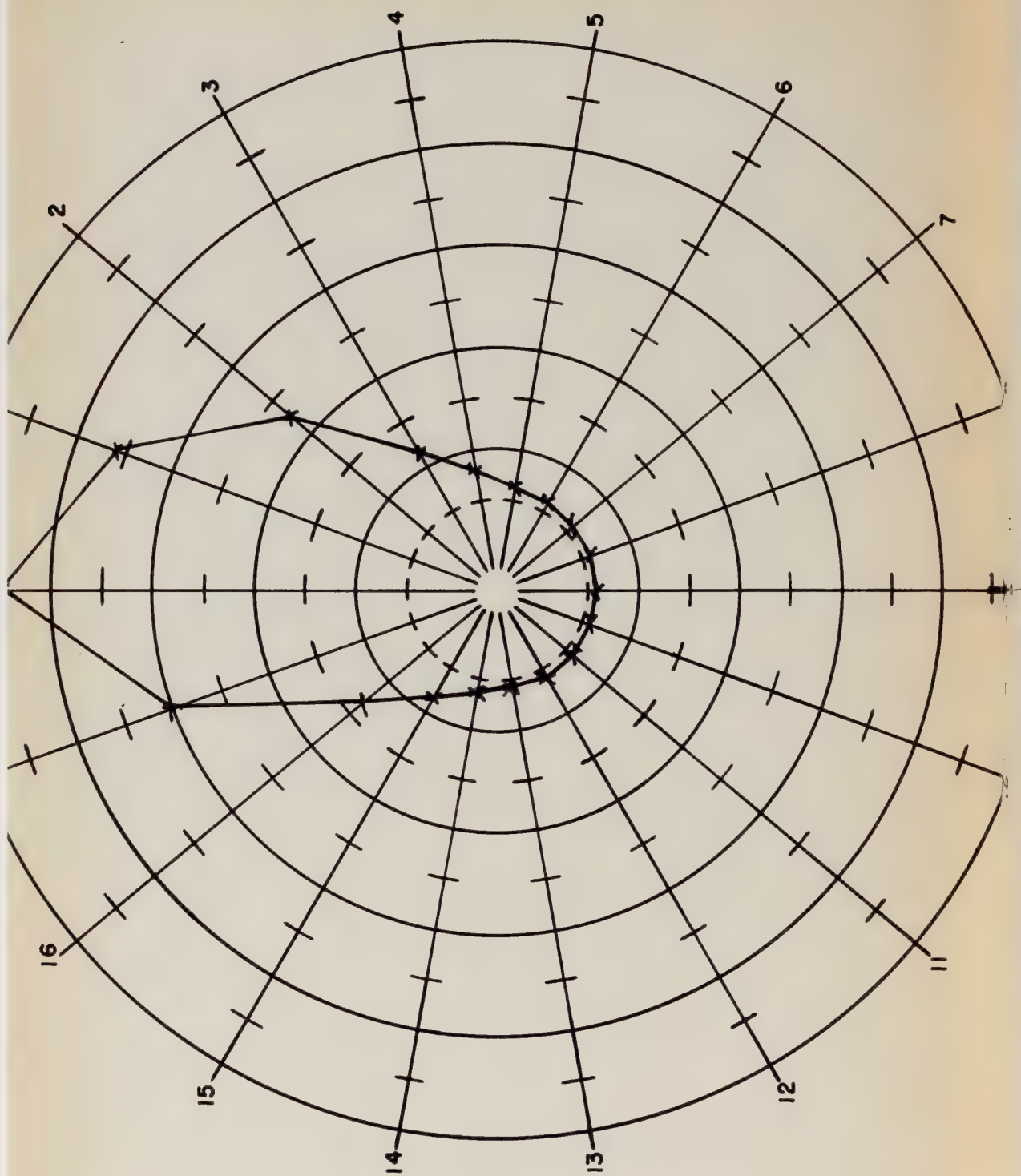
RADIORIENTATION
RECORD

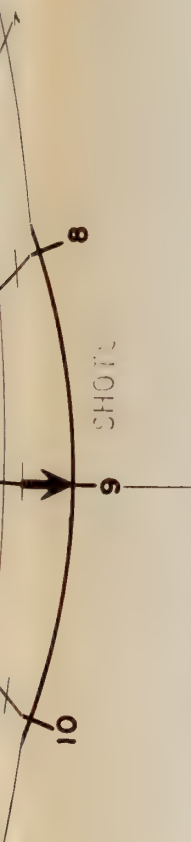


0 2 4 6 8 10 12 14 16 18 20
COUNTS INCREASE
COUNTS INCREASE









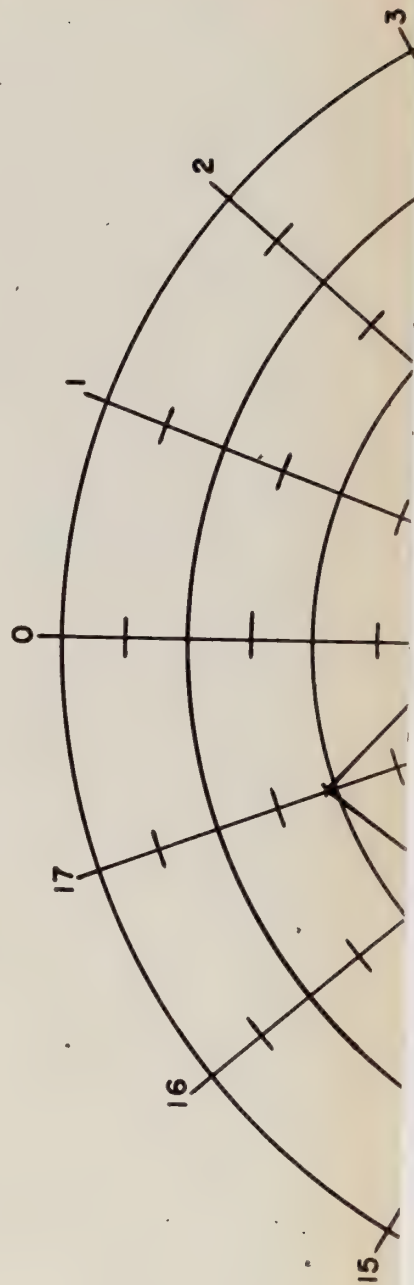
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

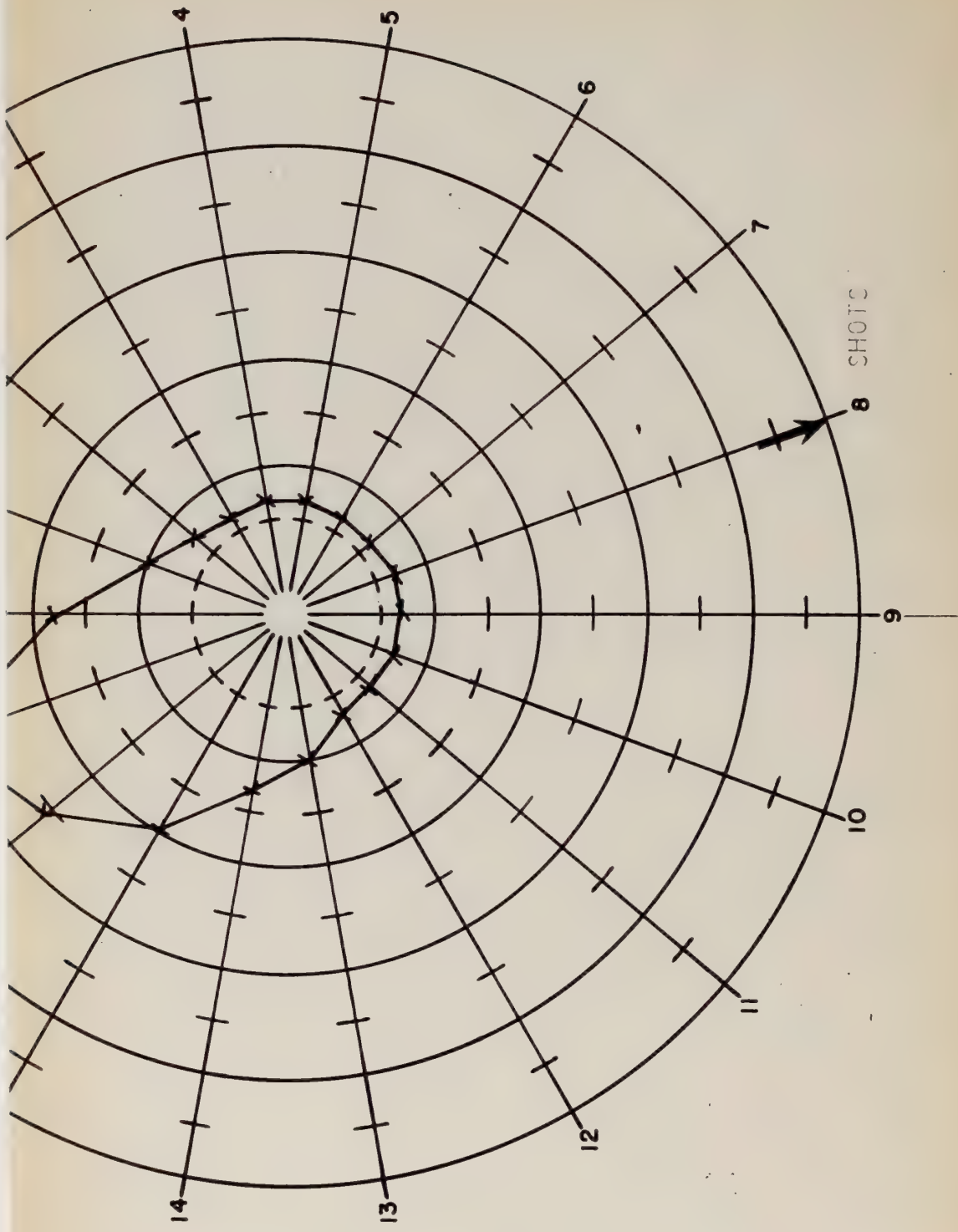
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 2-4-1-1-1 STRING-PERFORATED 1449-1459 ONE SHOT PER FOOT WITH
1 11.16" HYPERDOME



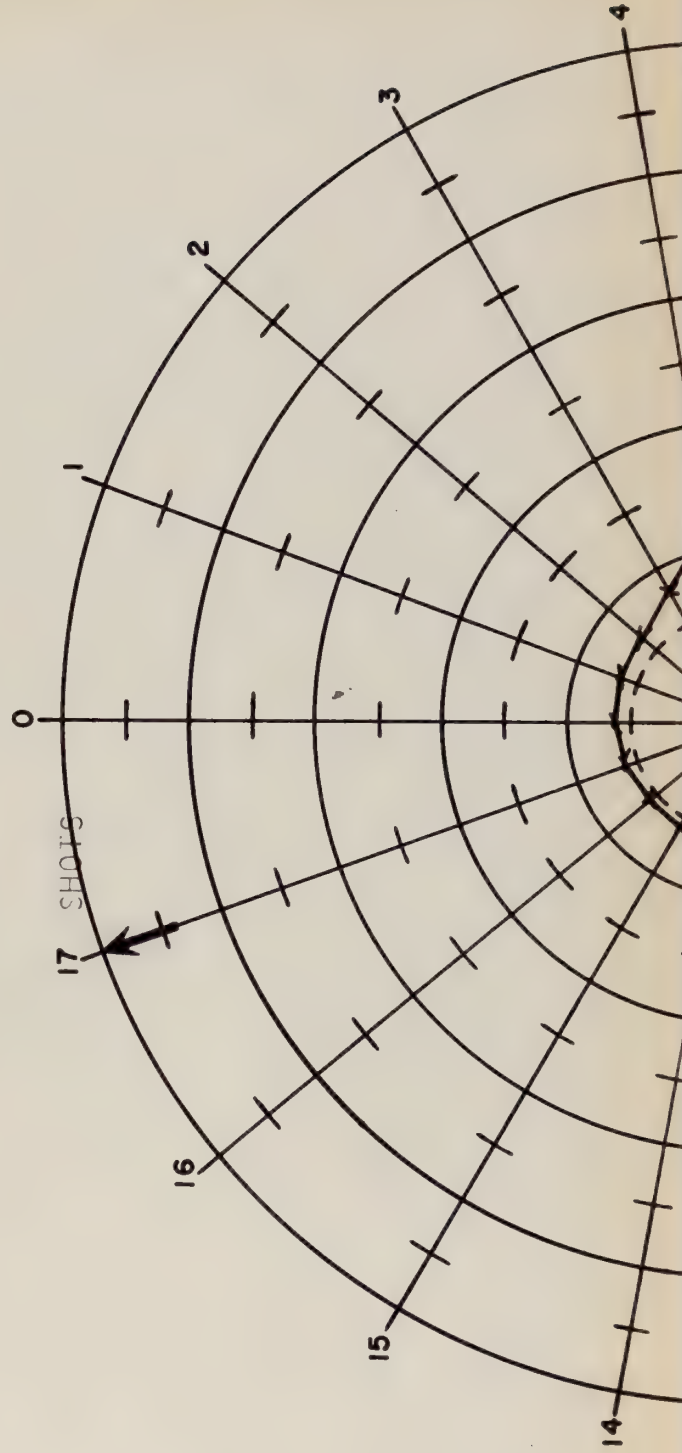


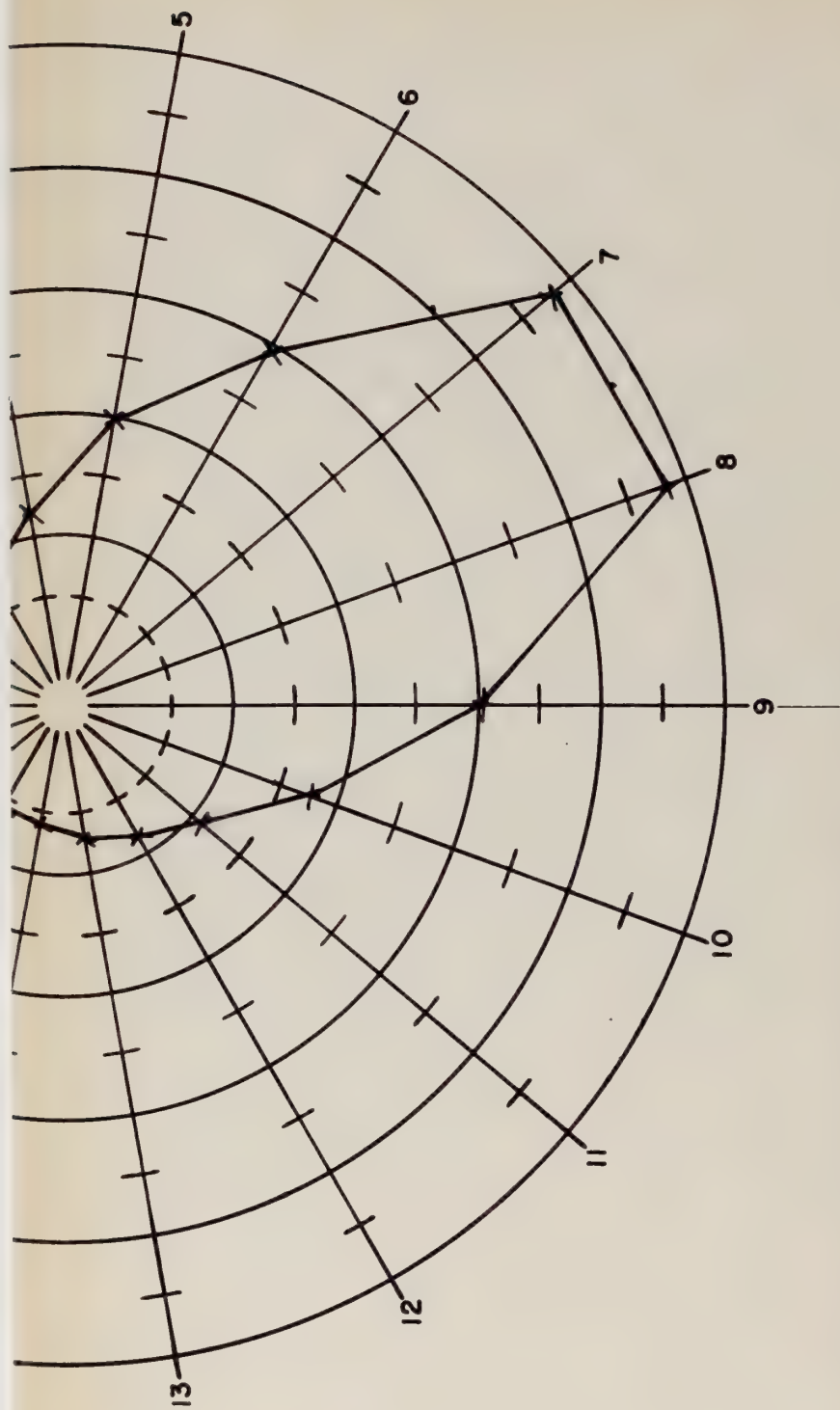
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the area and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

NO. 2-MIDDLE STRING-PERFORATED 1438-1443 ONE SHOT PER FOOT WITH
1 11, 16" HYPERDOME





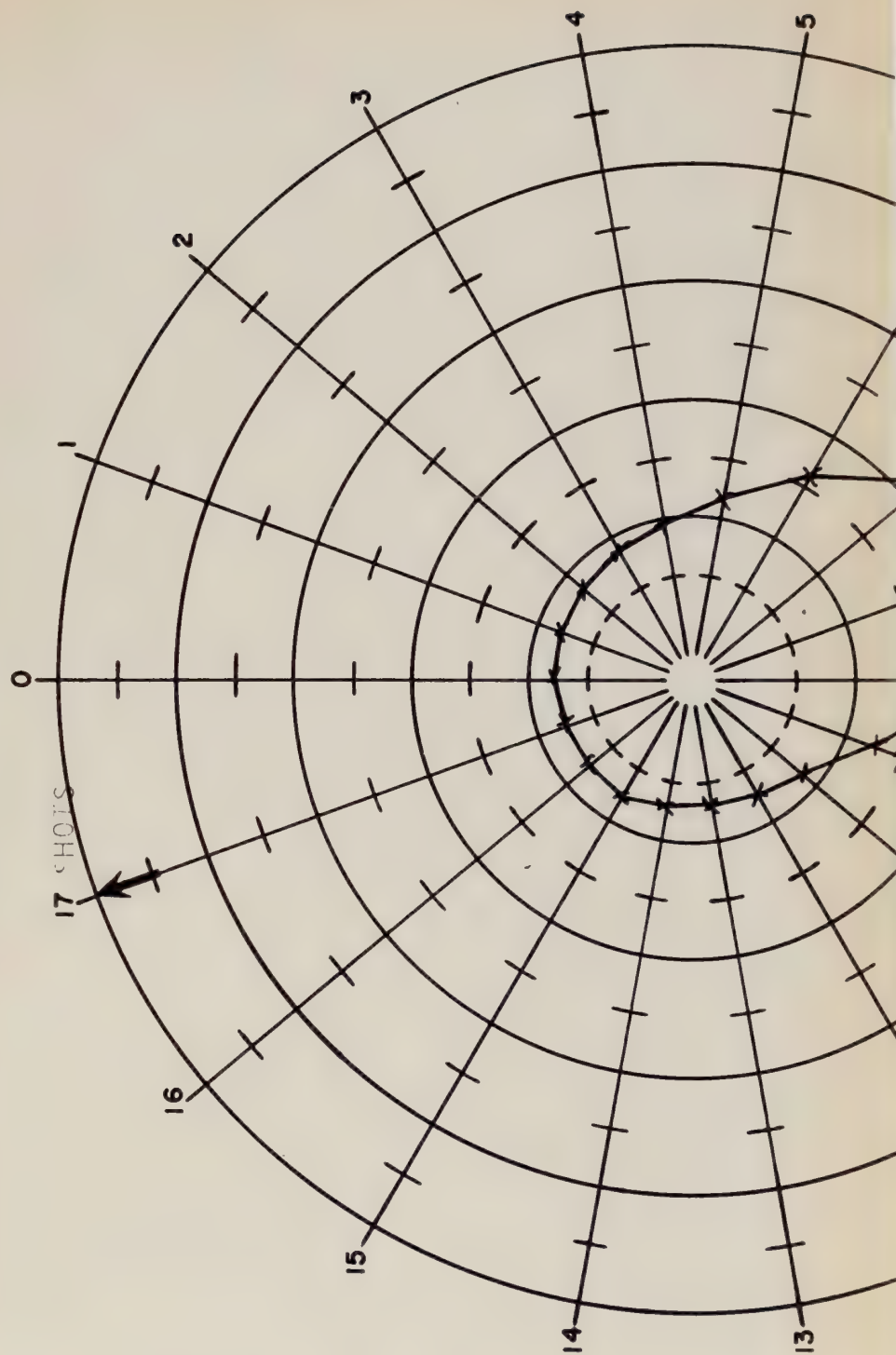
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

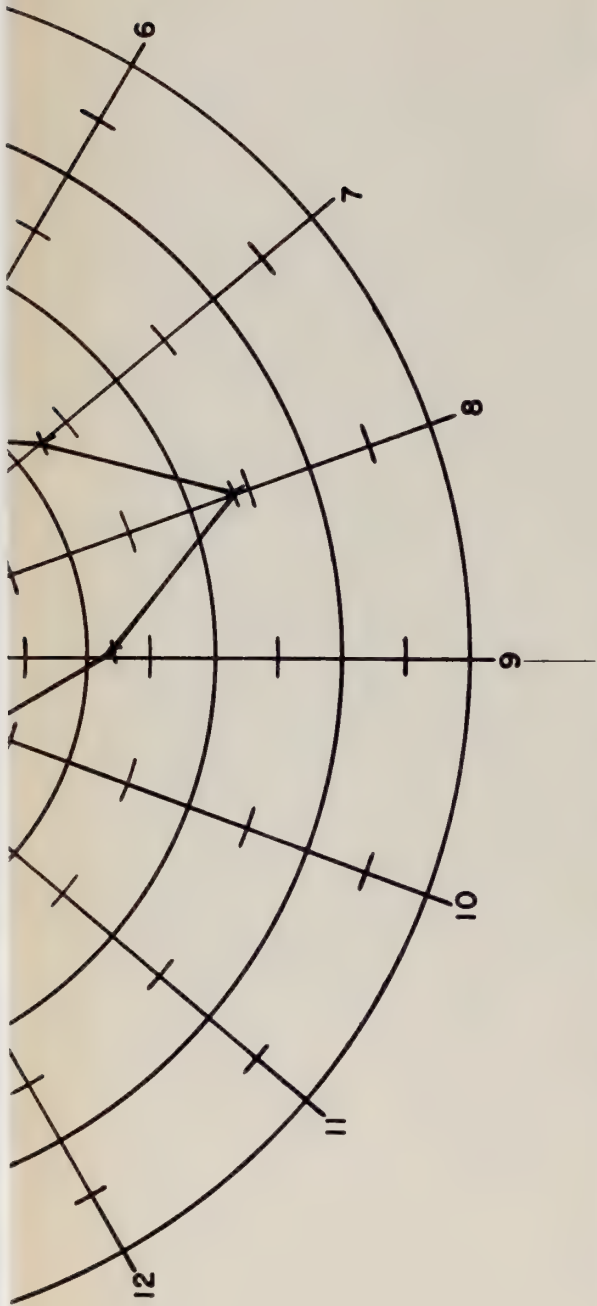
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NC.2-MIDDLE STRING-PERFORATEL 1430-1437 ONE SHOT PER FOOT WITH
1 11/16" HYPERDOME



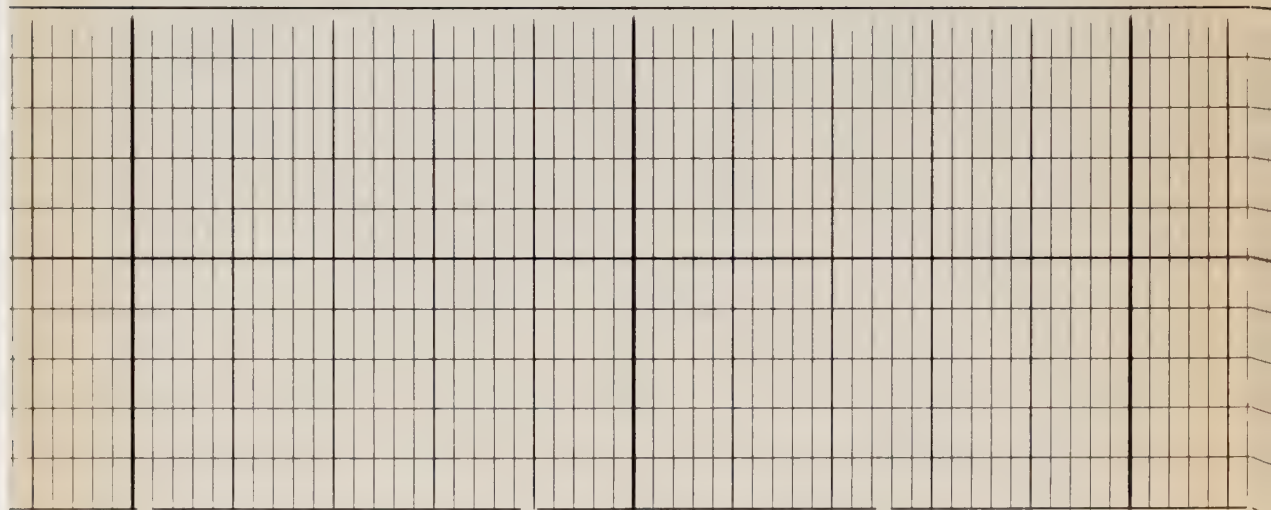
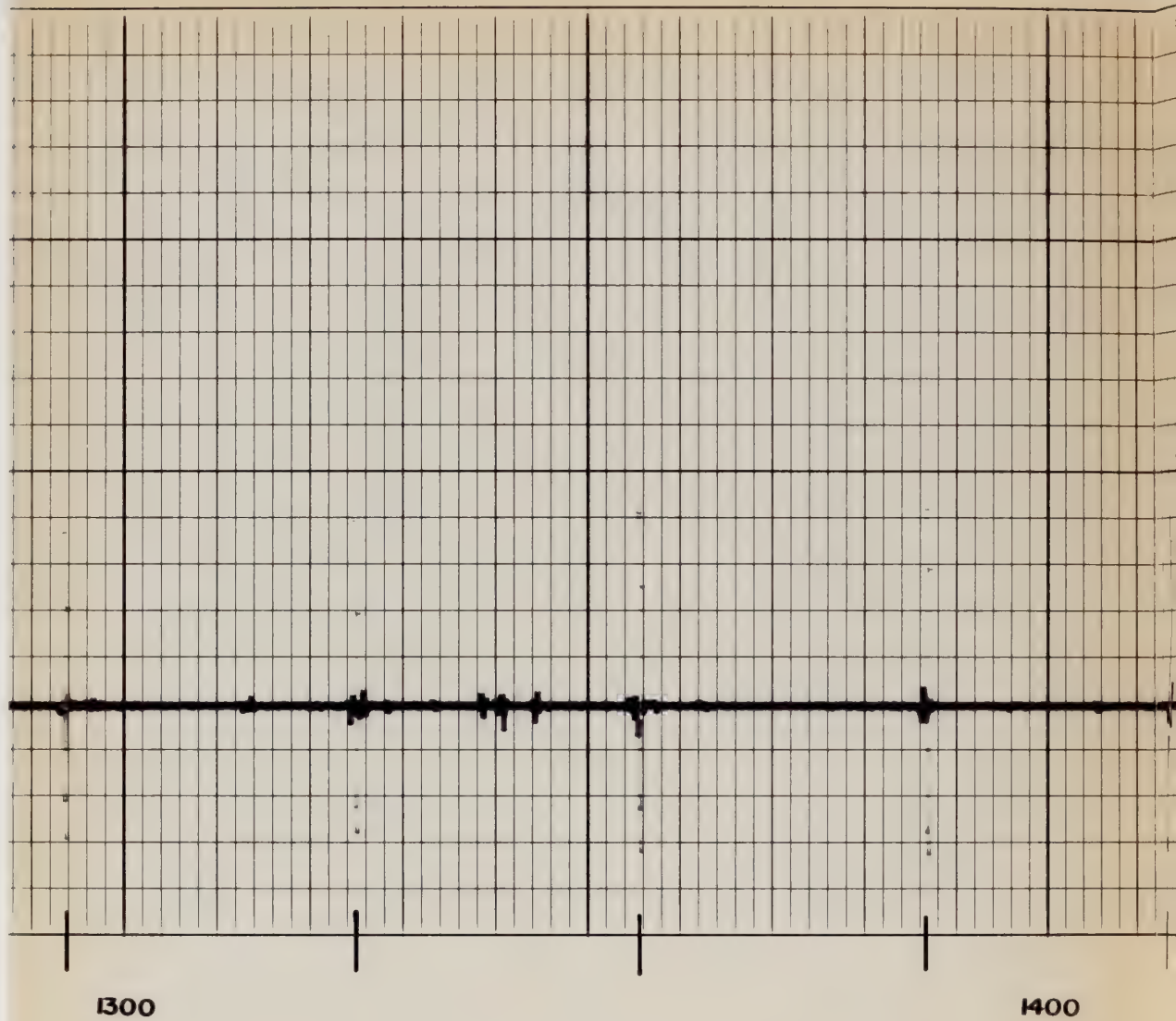


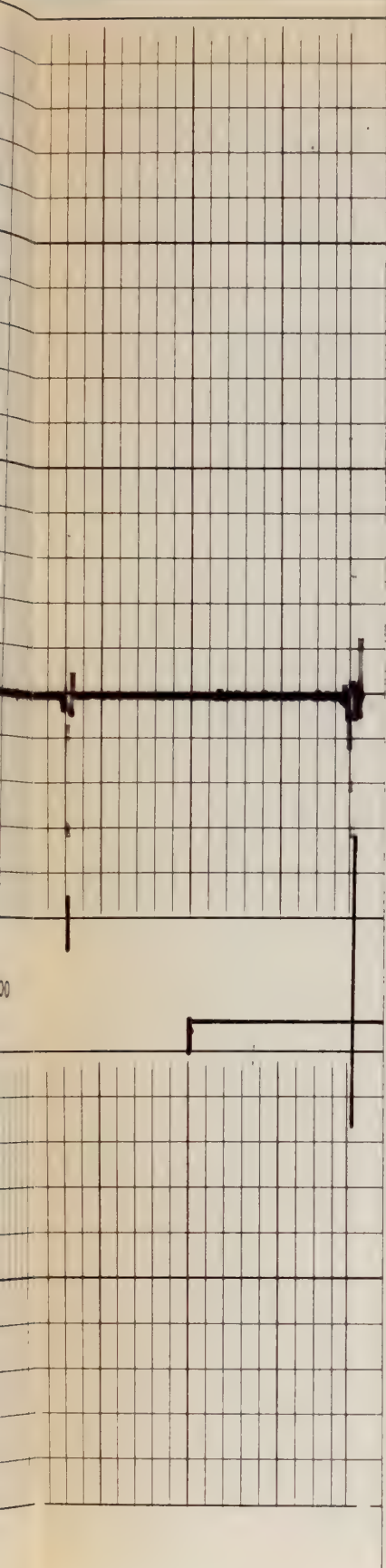
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

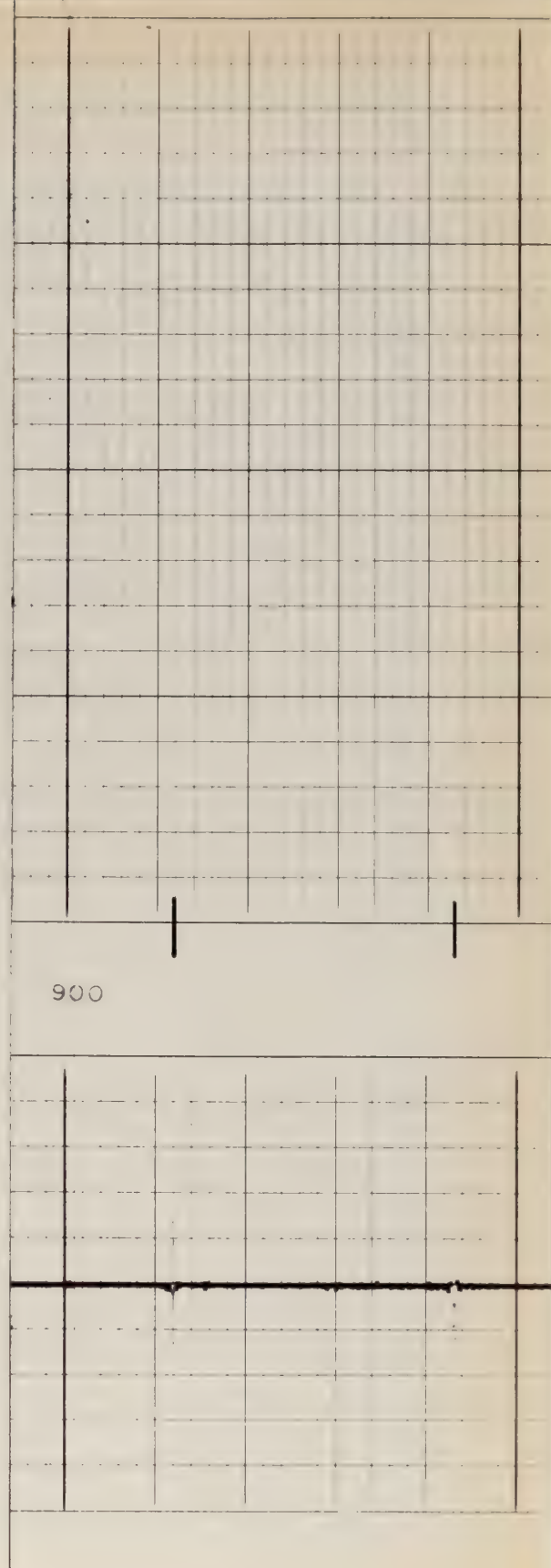
NO. 1-MODULE STRING-COLLAR LOG RUN AFTER PERFORATING

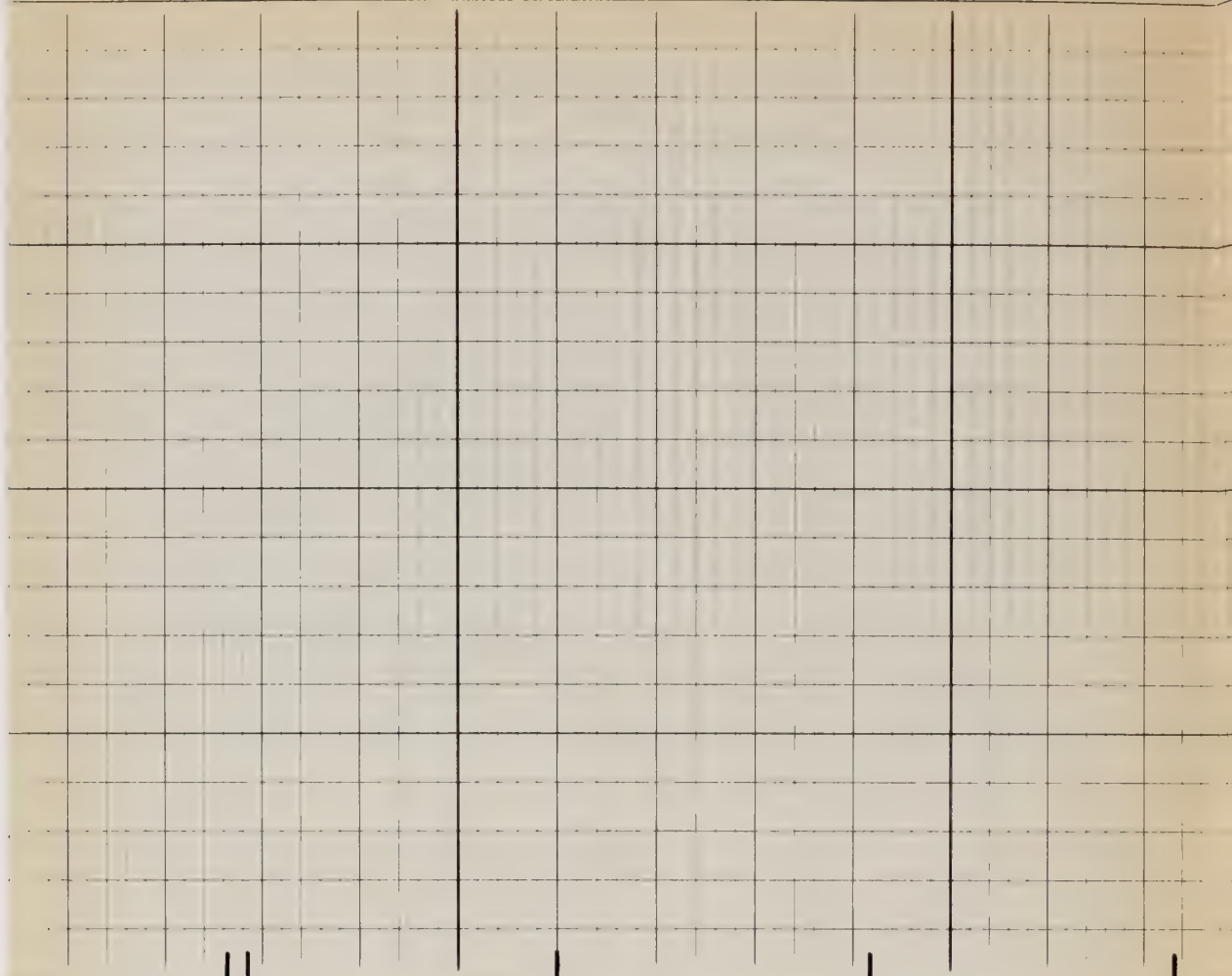






NO. 3-SHORT STRING-COLLAR LOG RUN BEFORE PERFORATING





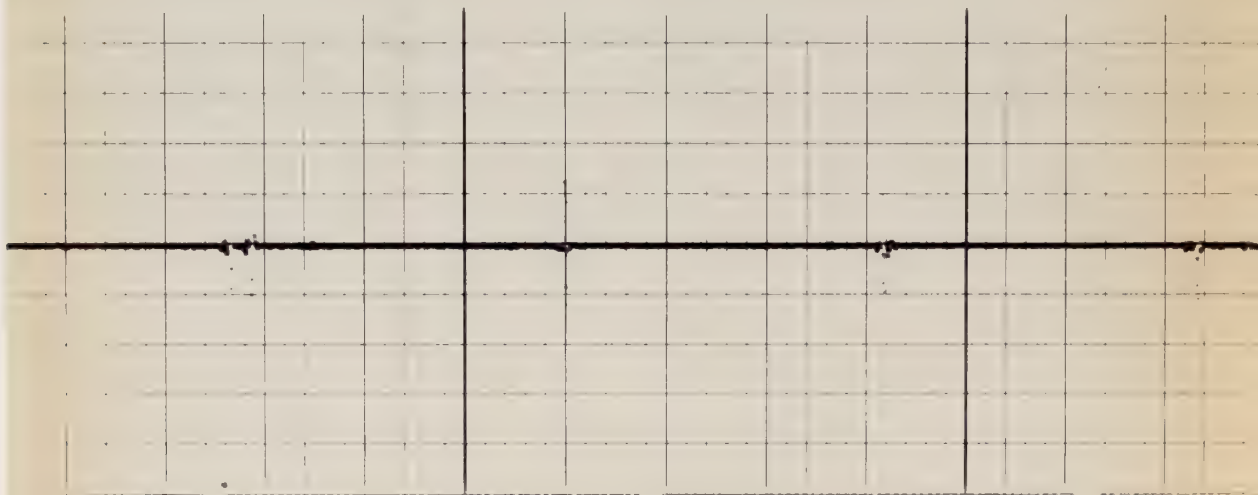
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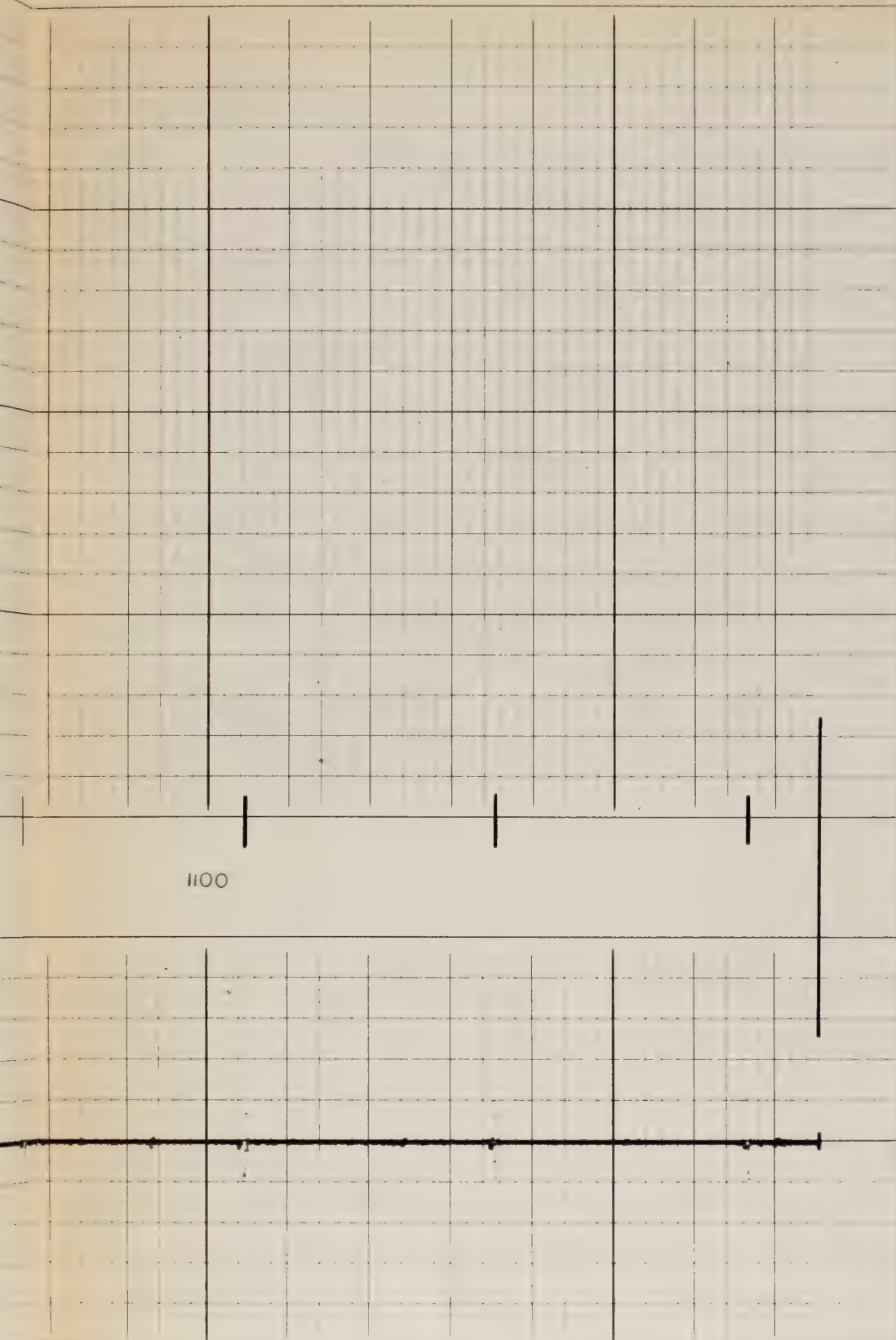
|

|

|

1000



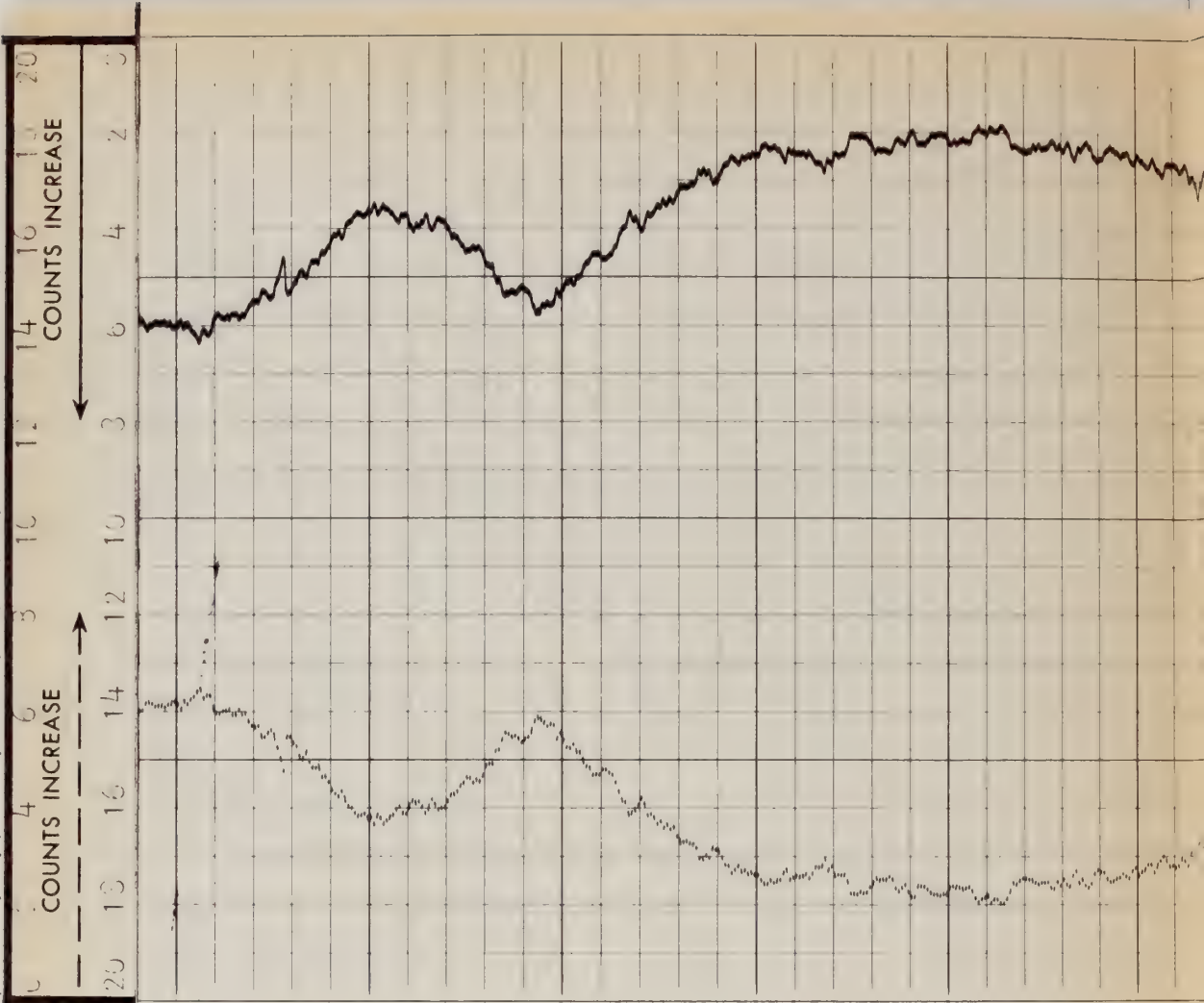


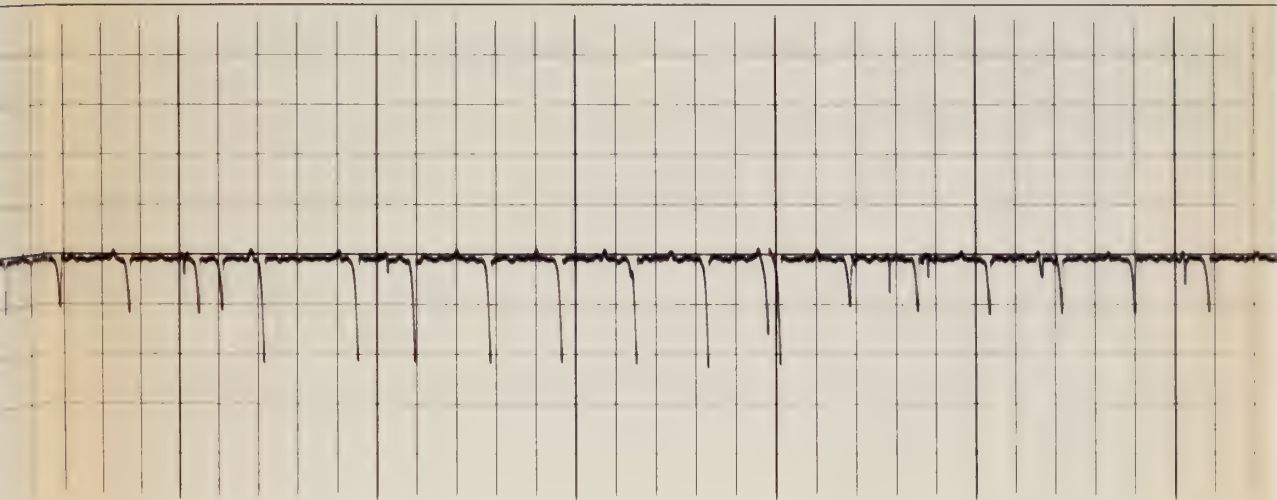
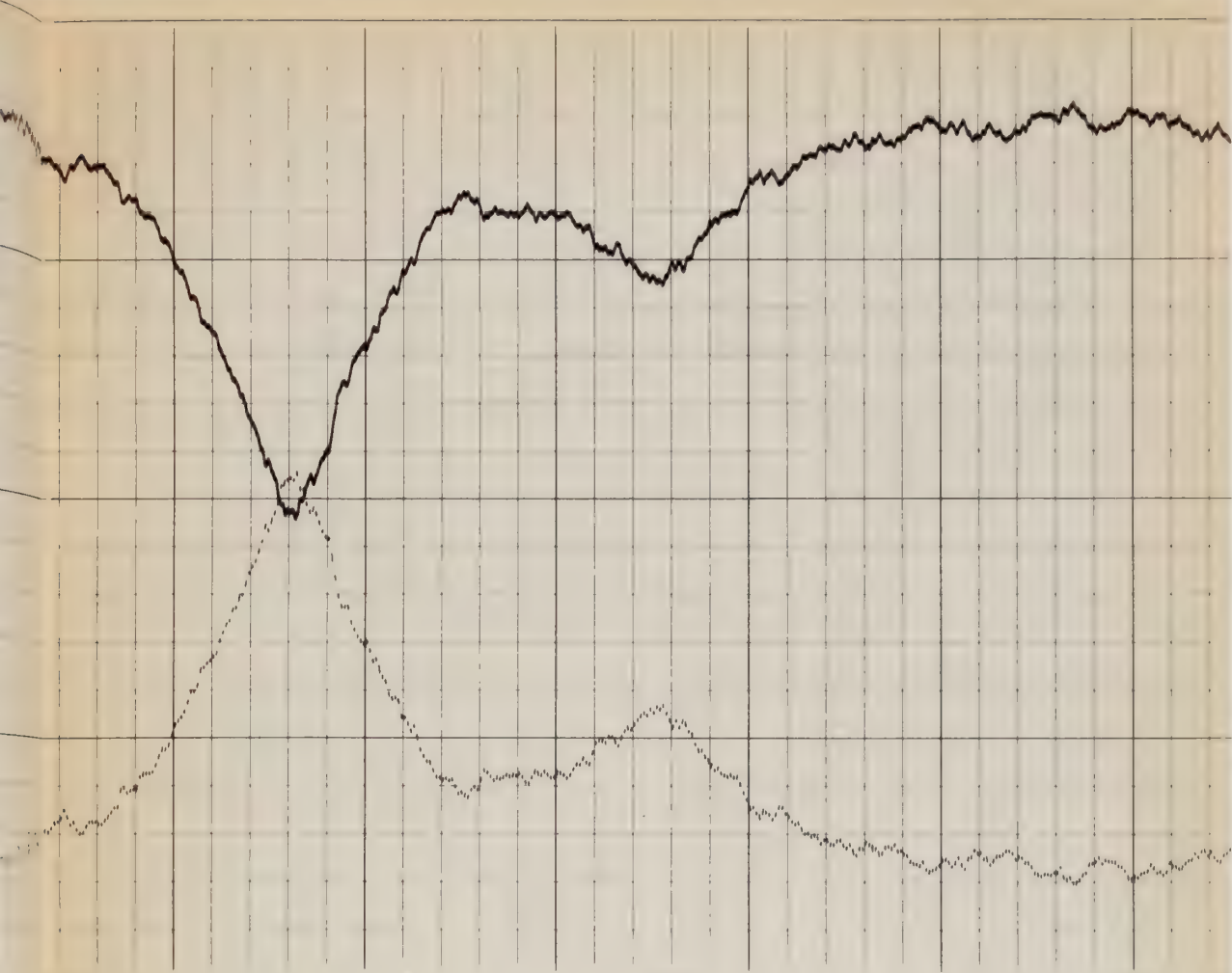
1100

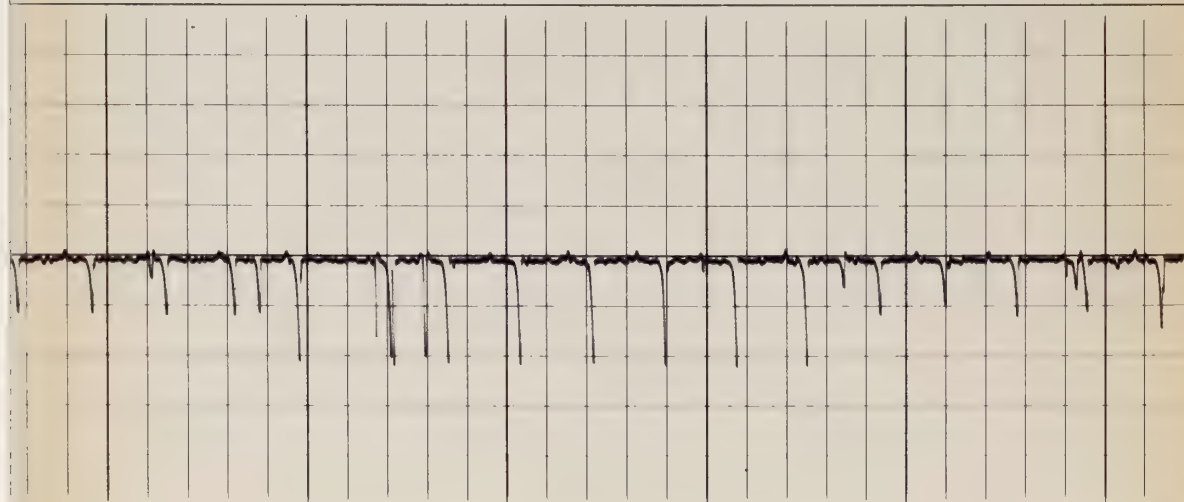
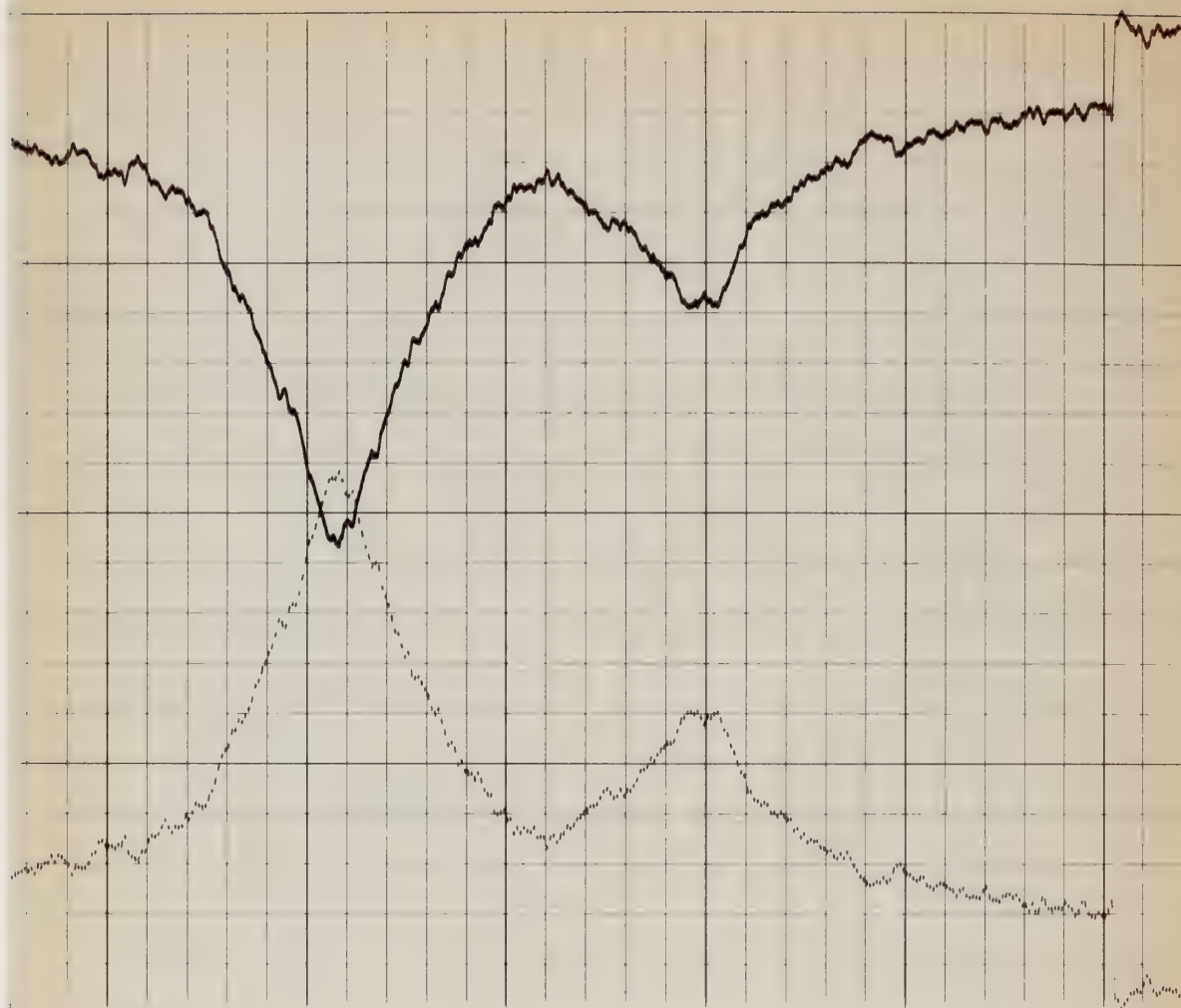
RADIORIENTATION
RECORD

INDEXING
RECORD

TYPICAL ORIENTING
RECORD IN 22-3-
CHORE STRIP
FILMSTRIP 1103-
1193



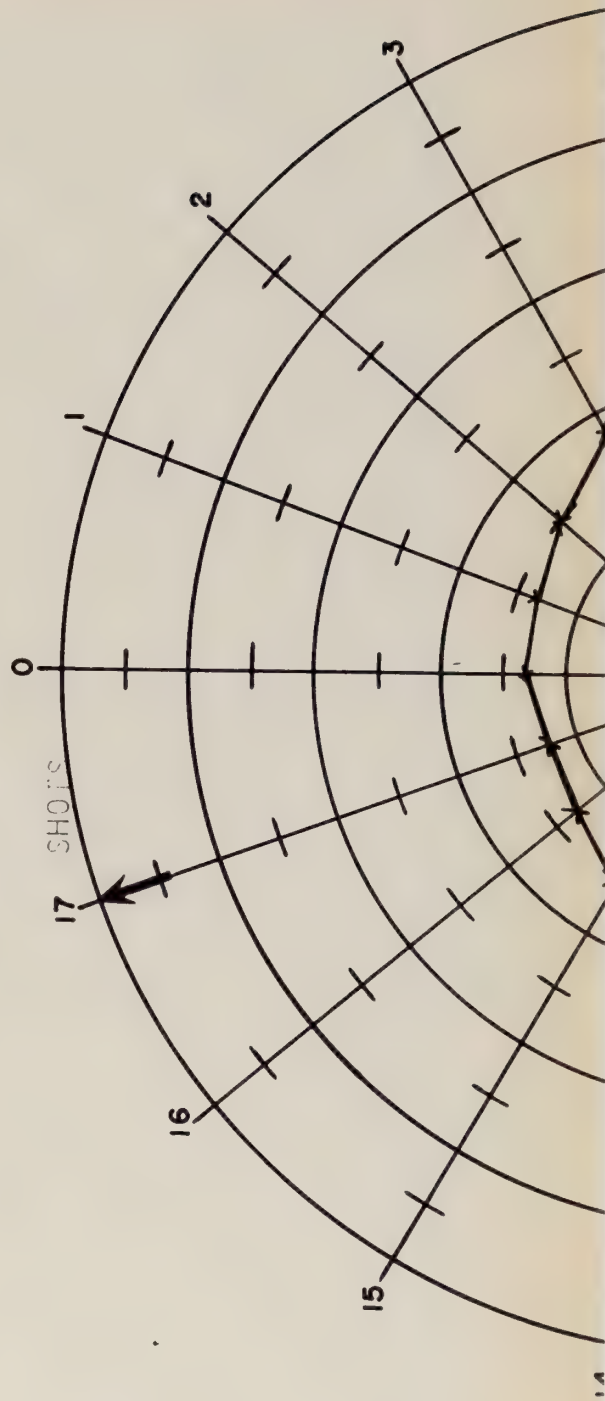


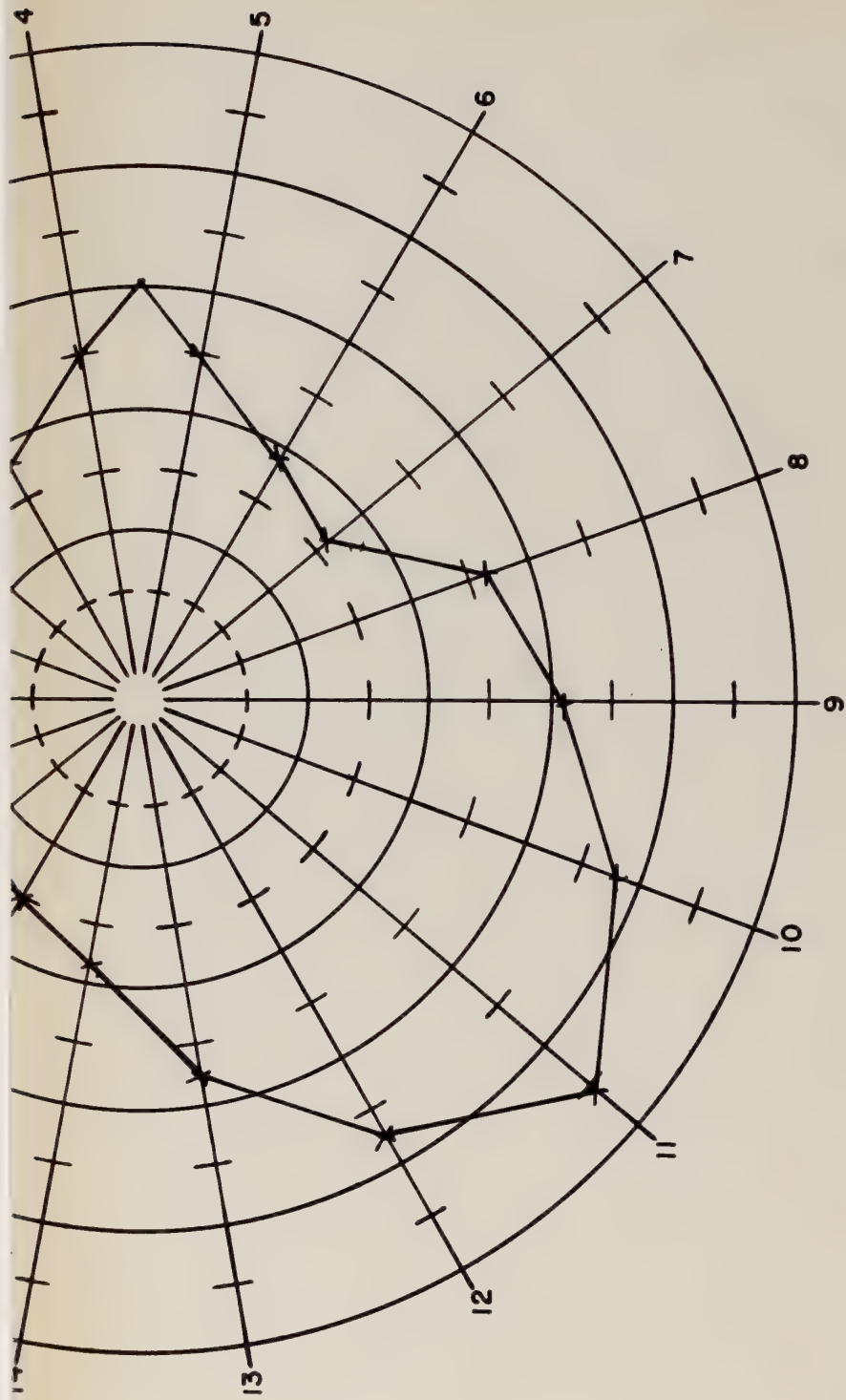


RADIO-ORIENTATION PLOT

POT-B

NO. 3-SHORT STRING-PERFORATED 1183-1193 ONE SHOT PER FOOT WITH
1 11/16" HYPERDOME





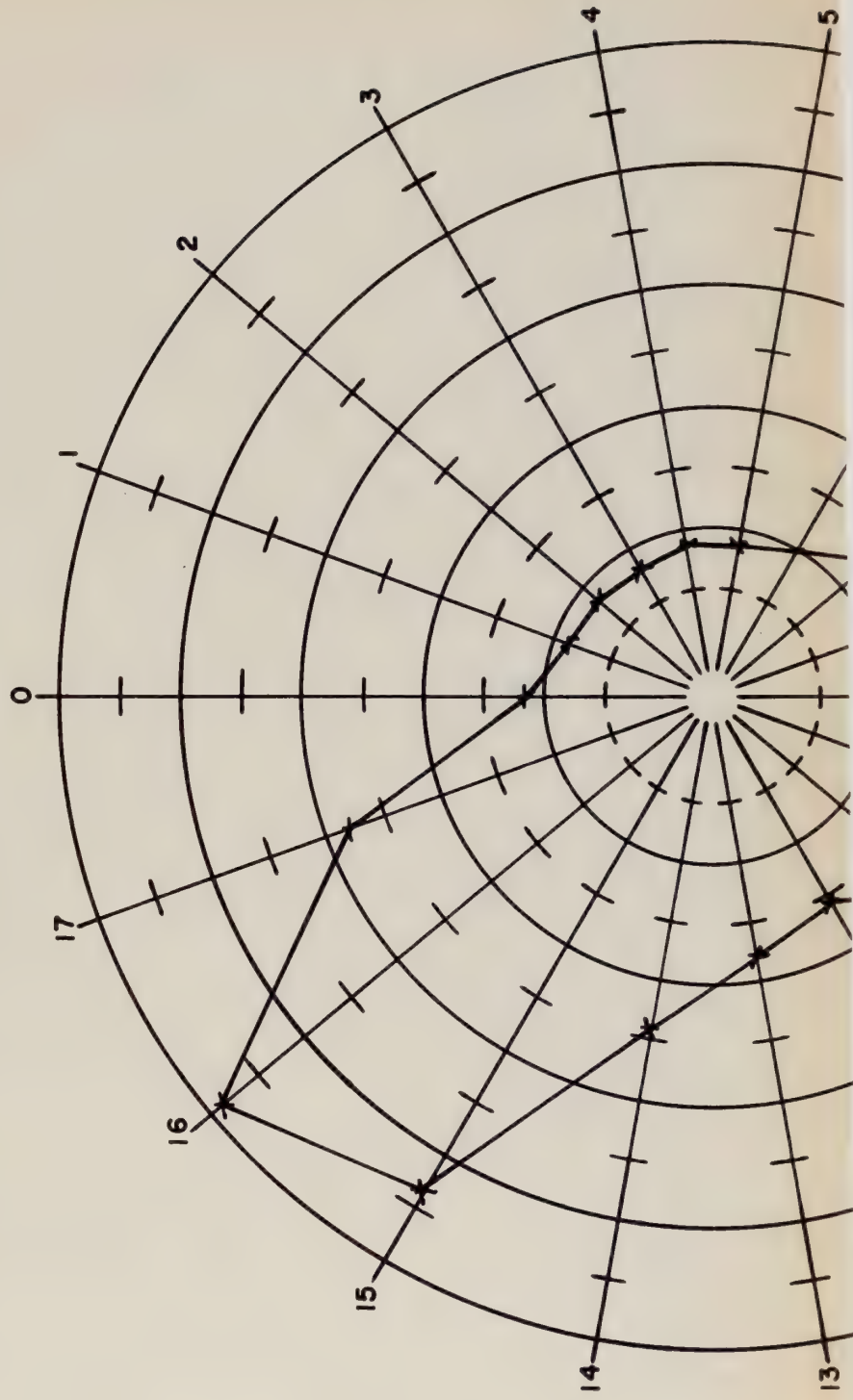
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

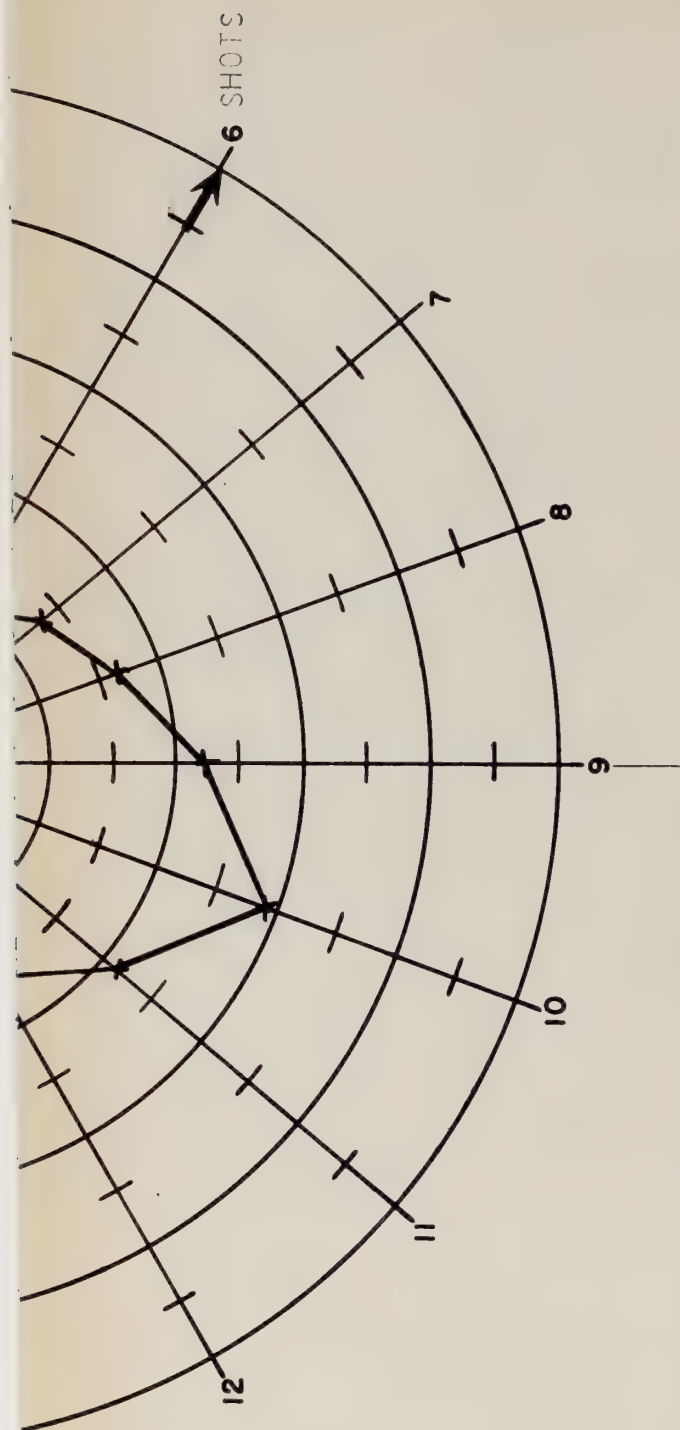
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3-SHORT STRING-PERFORATED 1172-1182 ONE SHOT PER FOOT WITH
1 11/16" HYPERDOME





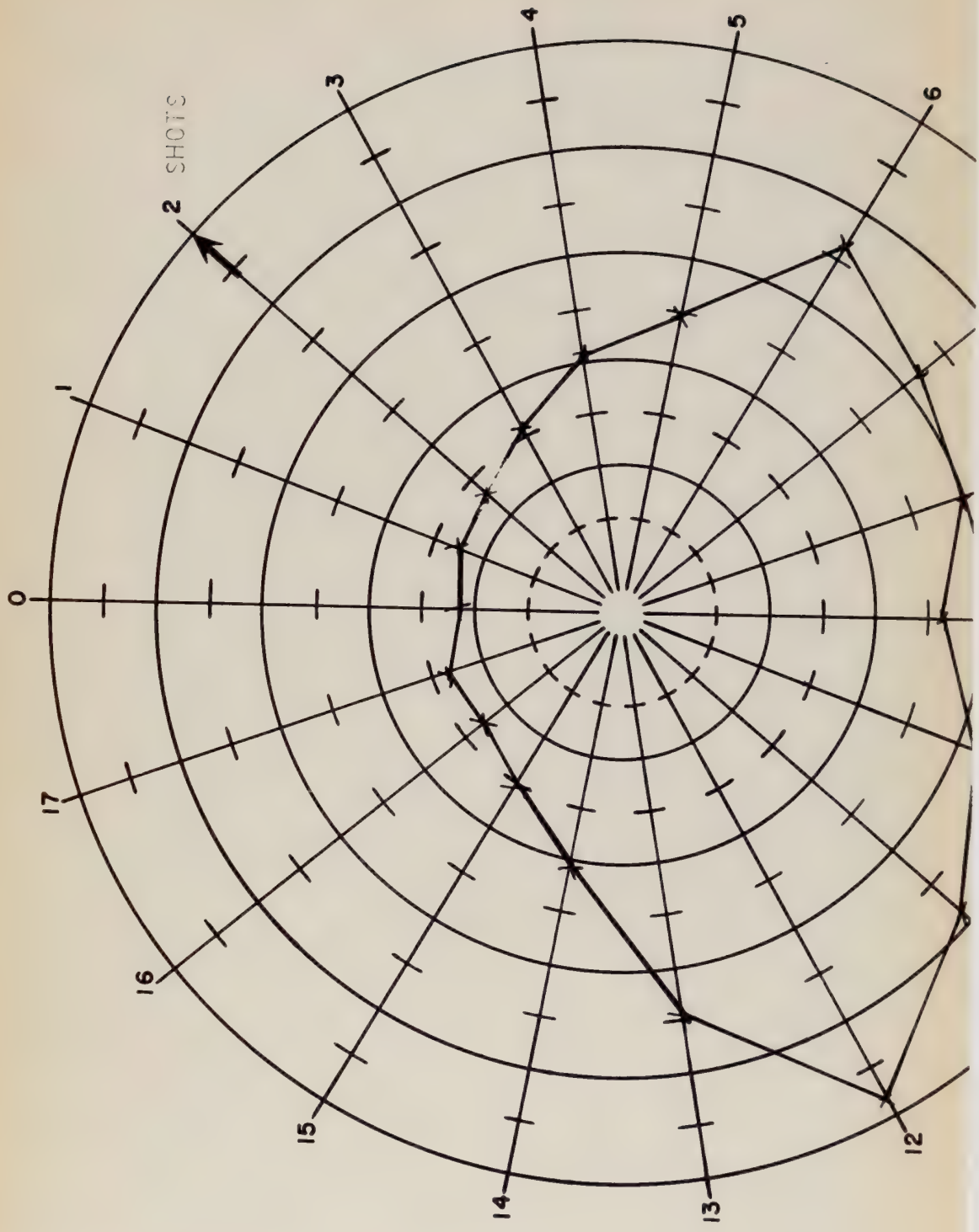
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

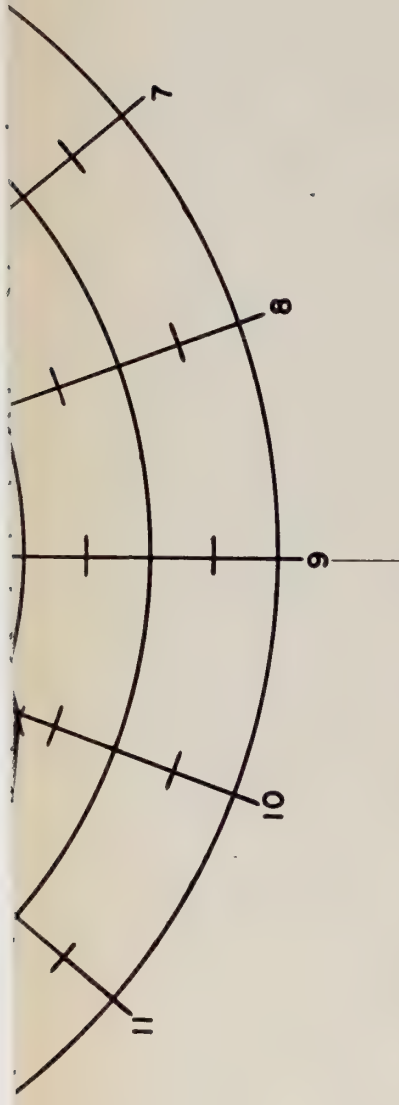
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

STATION: CONING: EXPLORATION: 1101-1111 ONE SHOT PER FOOT 11H
1 11.16" HYPERDUOME





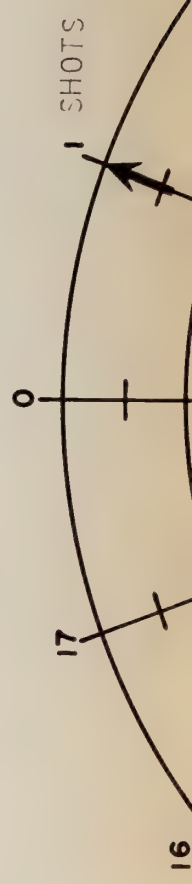
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

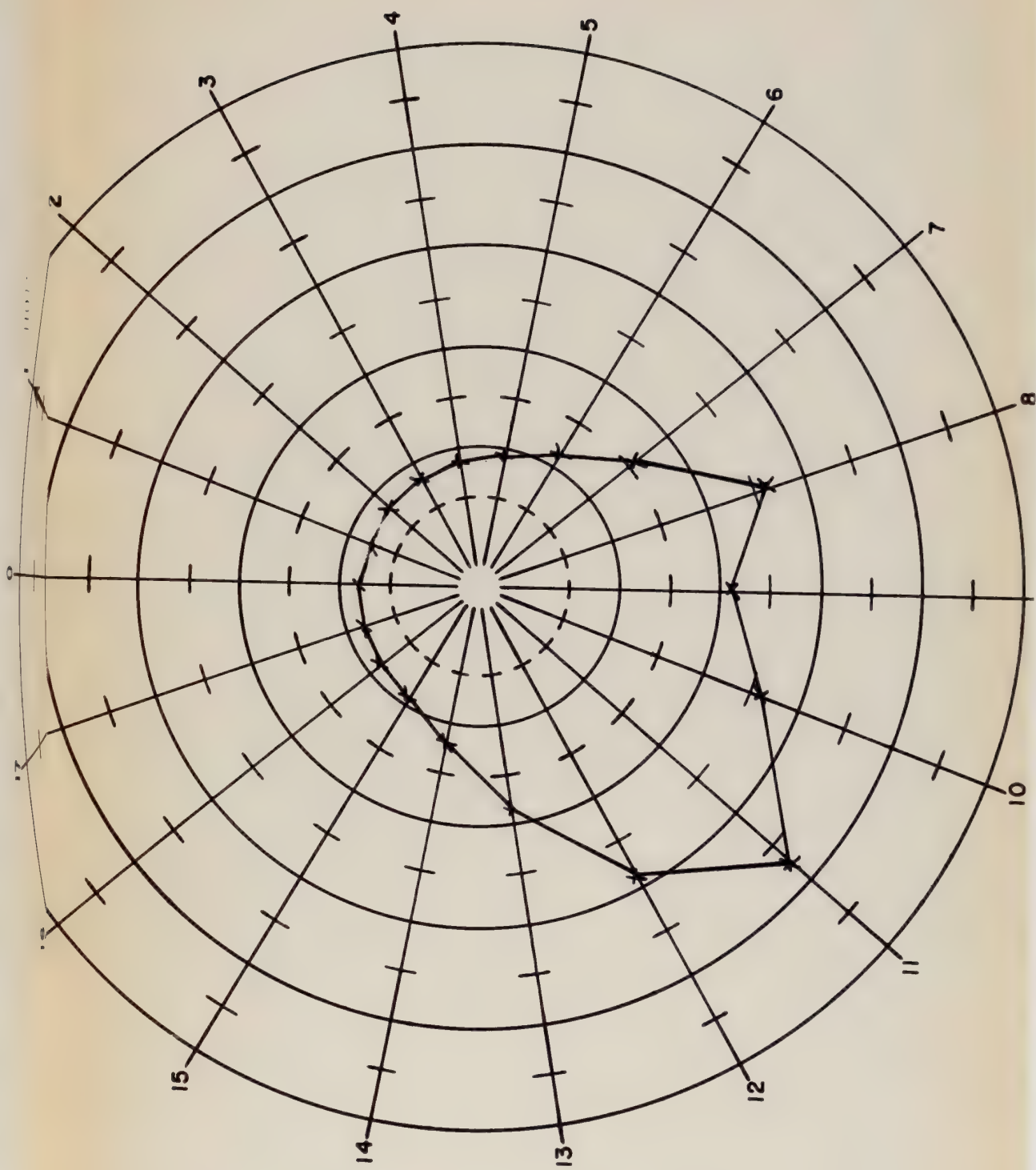
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3-SHORT STRING-PERFORATED 1150-1160 ONE SHOT PER FOOT WITH
1 11' 16" HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

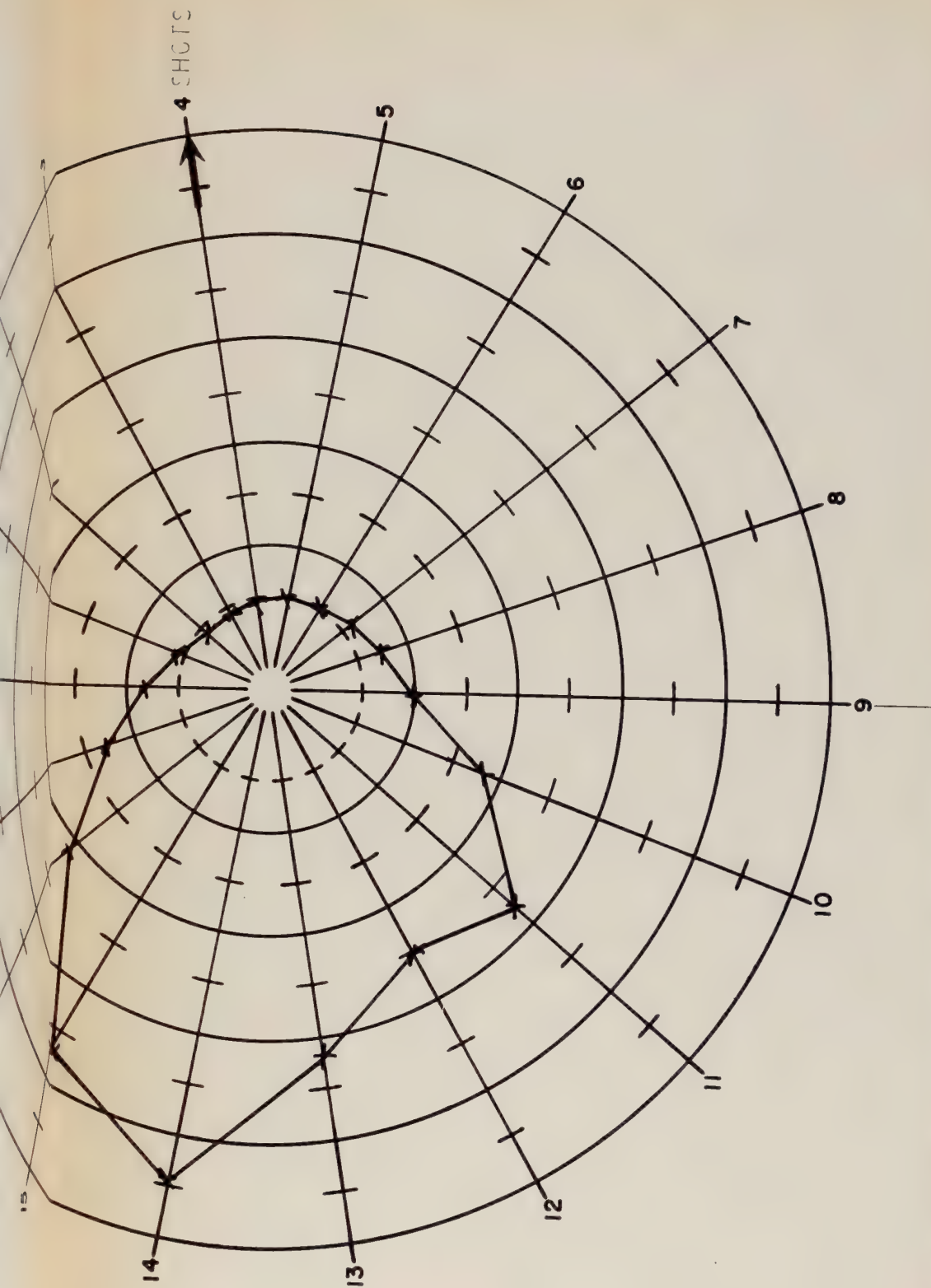
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3-SHORT STRING-PERFORATED 1130-1131 ONE SHOT PER FOOT WITH
1 11/16" HYPERDOME





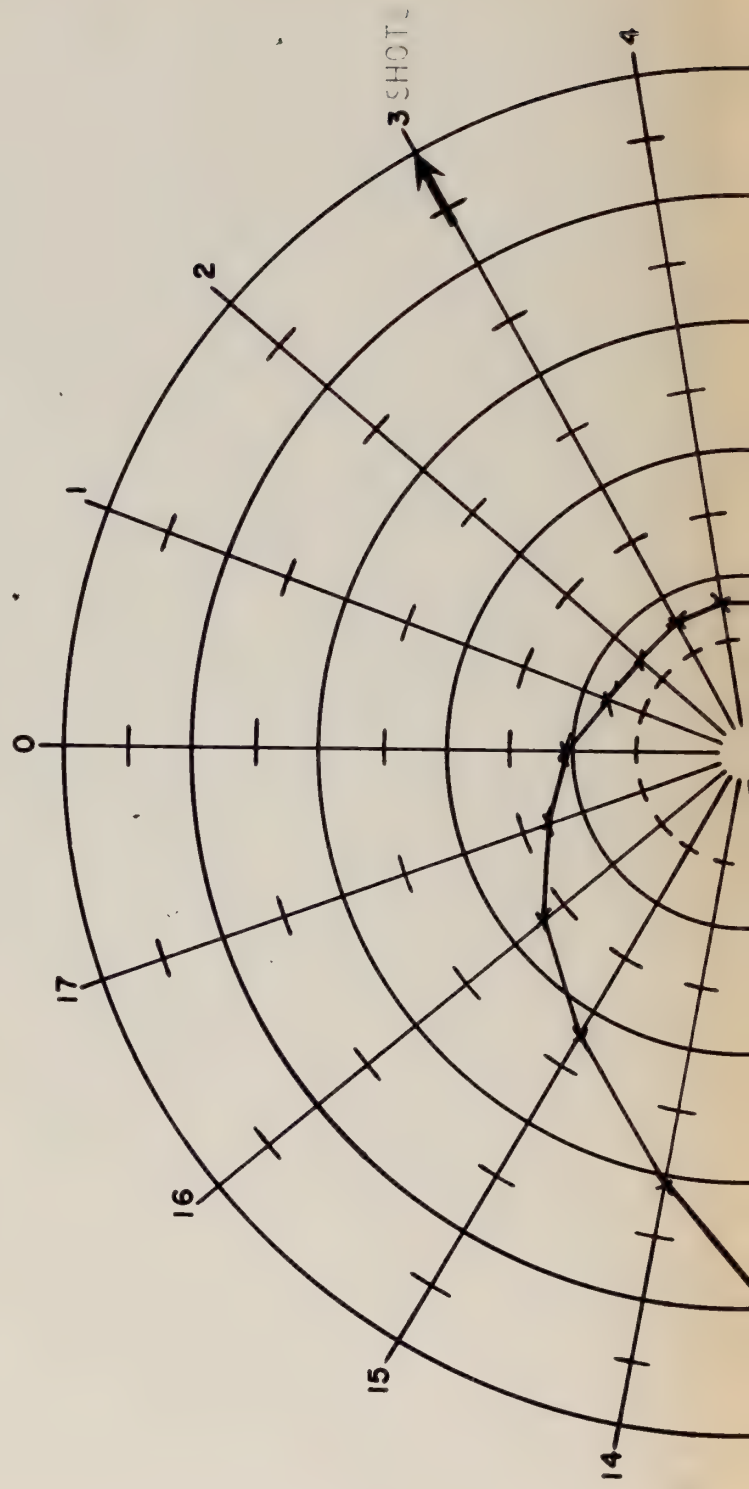
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

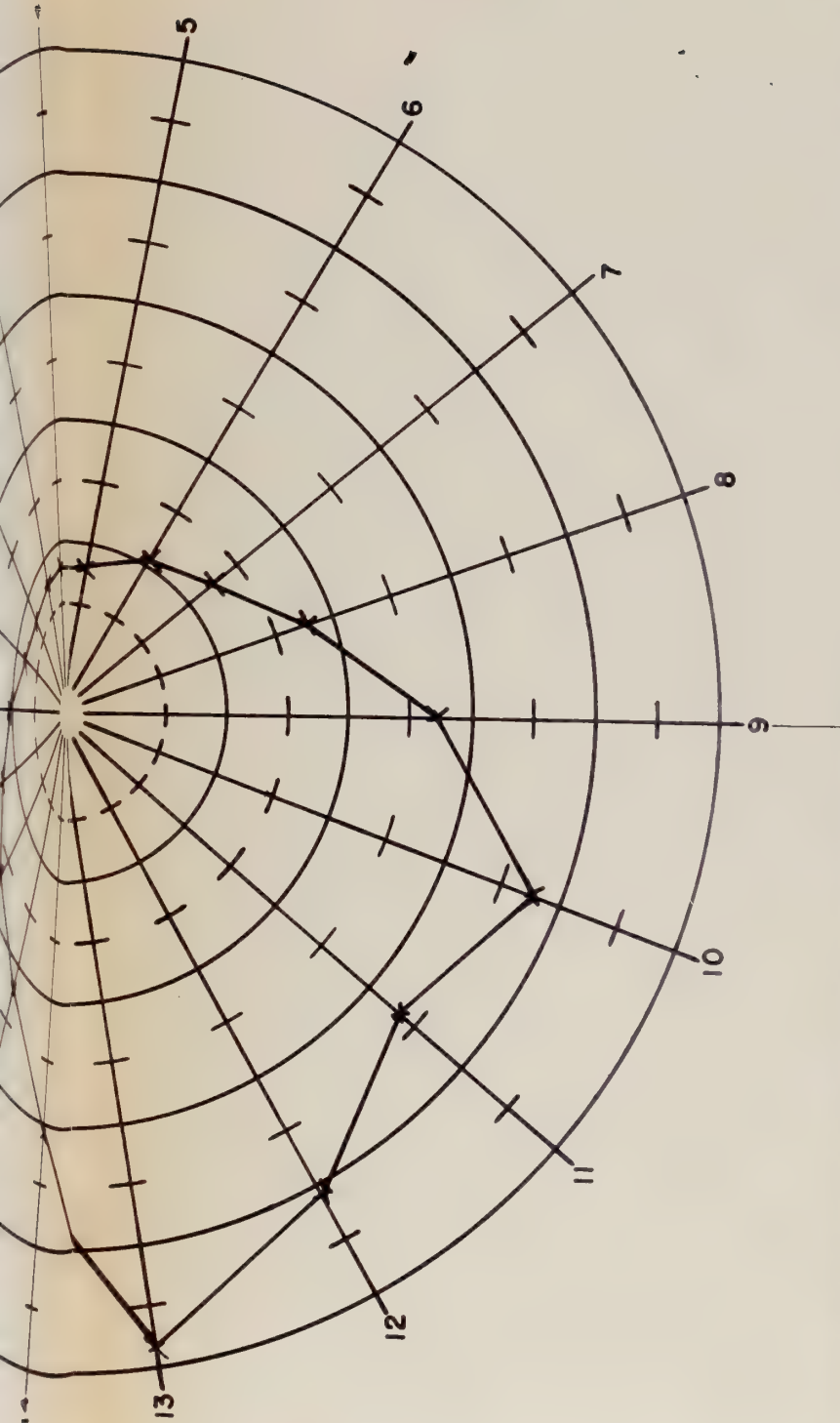
Schlumberger

RADIO-ORIENTATION PLOT

POT-B.

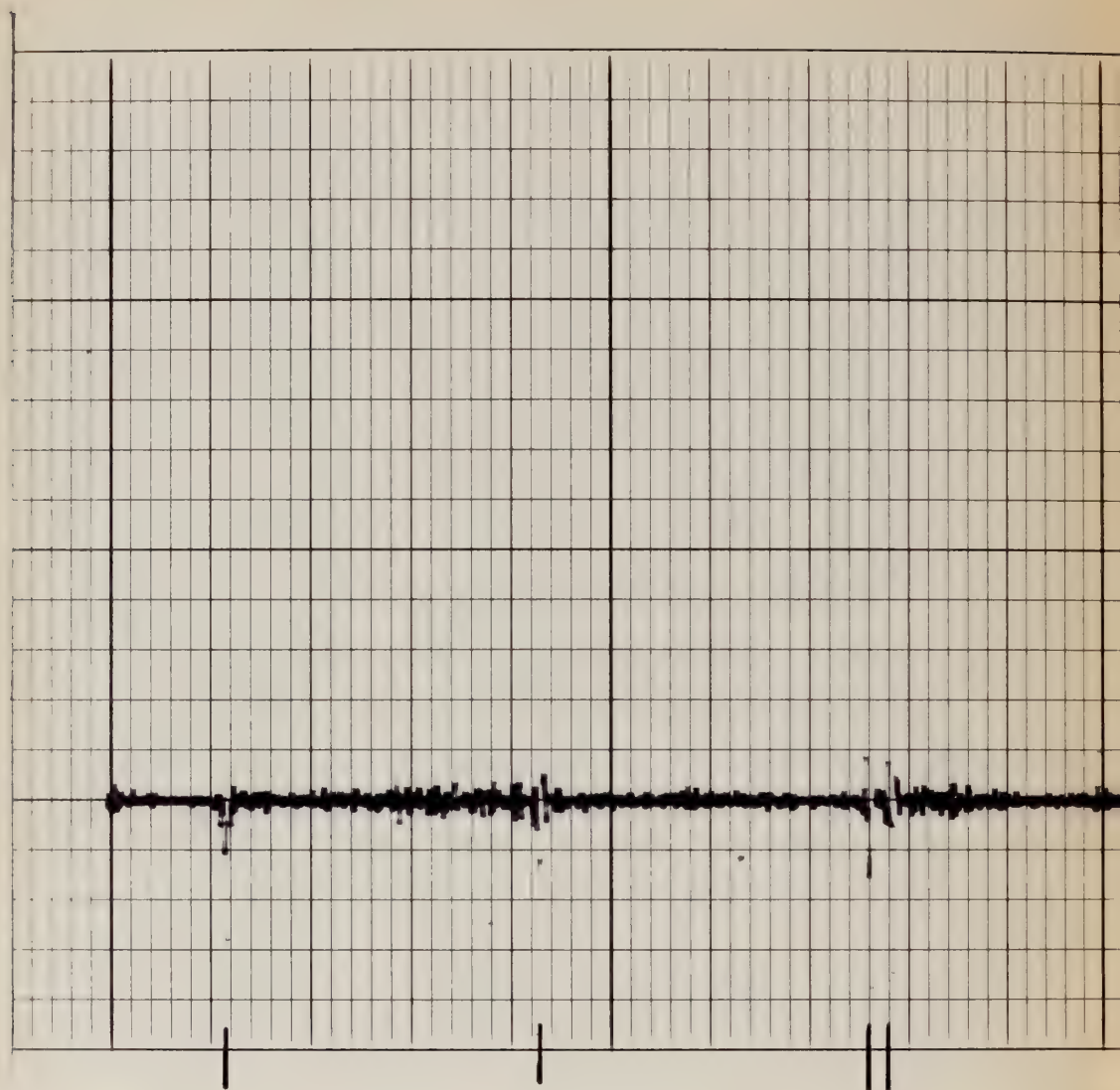
NO. 3-SHORT STRING-PERFORATED 1100-1101 ONE SHOT PER FOOT WITH
1 11/16" HYPERDOME





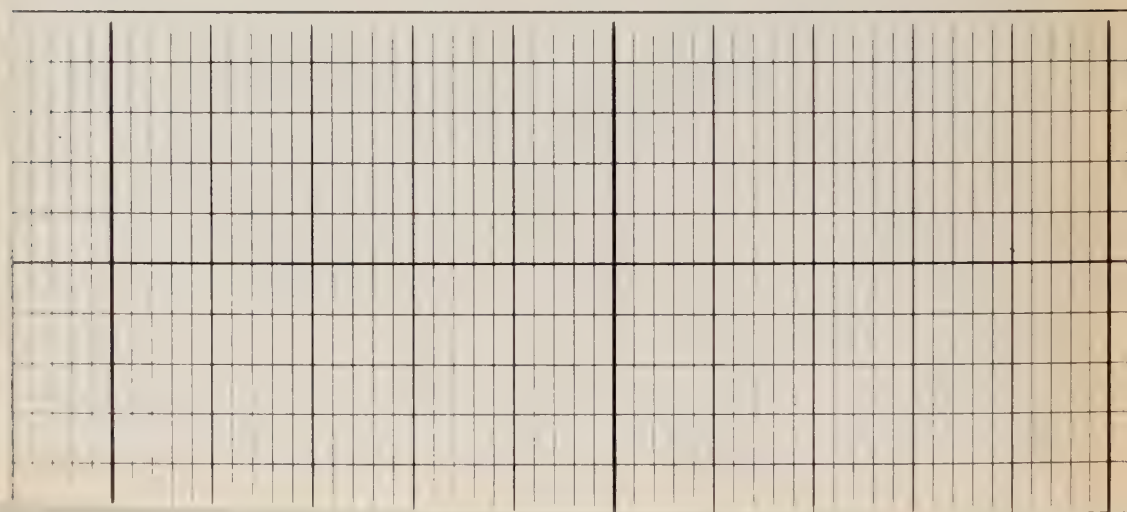
1. The first thing I noticed when I stepped out of the plane was the cold air. It was a sharp contrast to the warm, humid air of the tropics. I shivered slightly, but then I remembered that this was just the beginning of my journey. I took a deep breath and smiled.

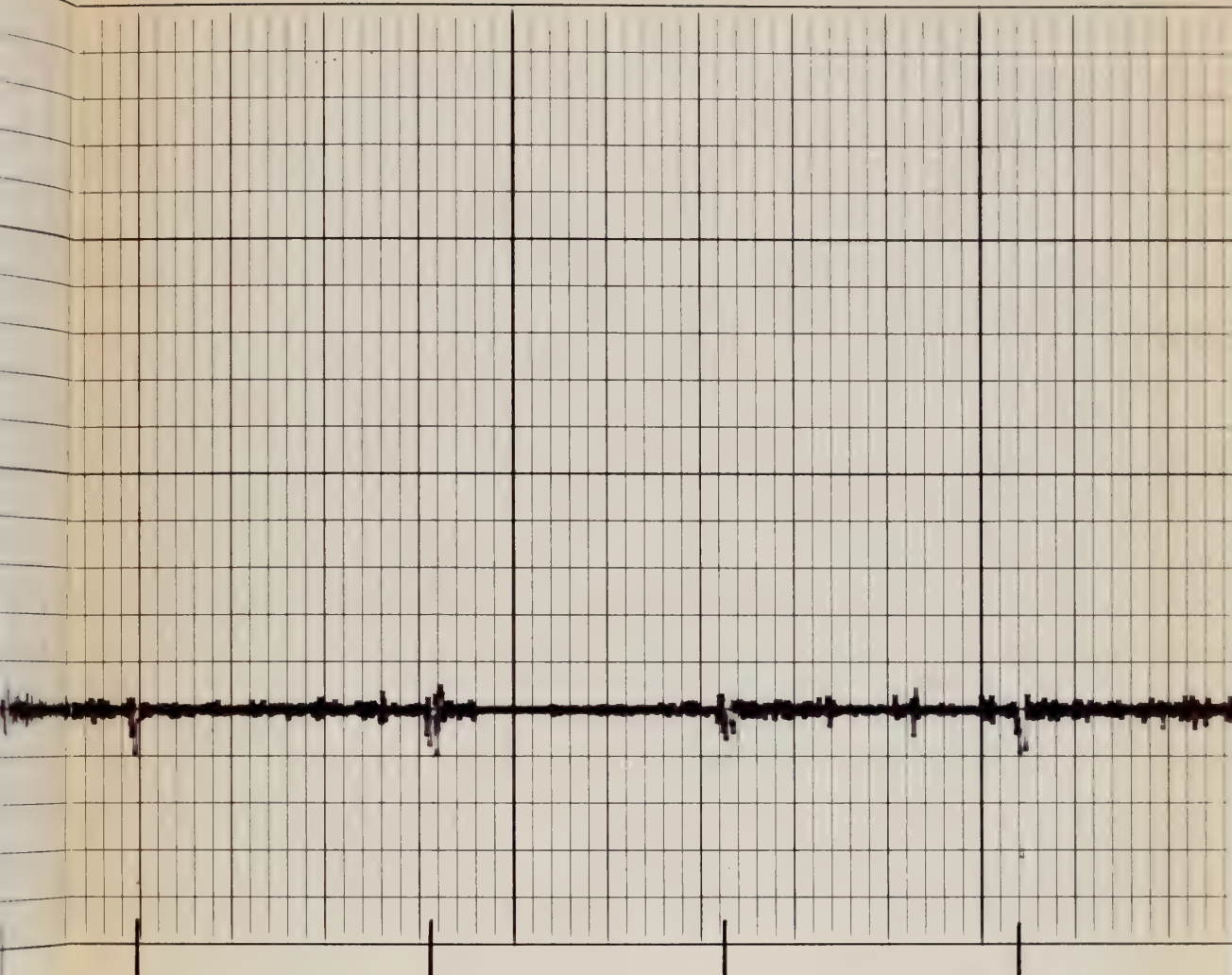
Schlumberger



0900

100

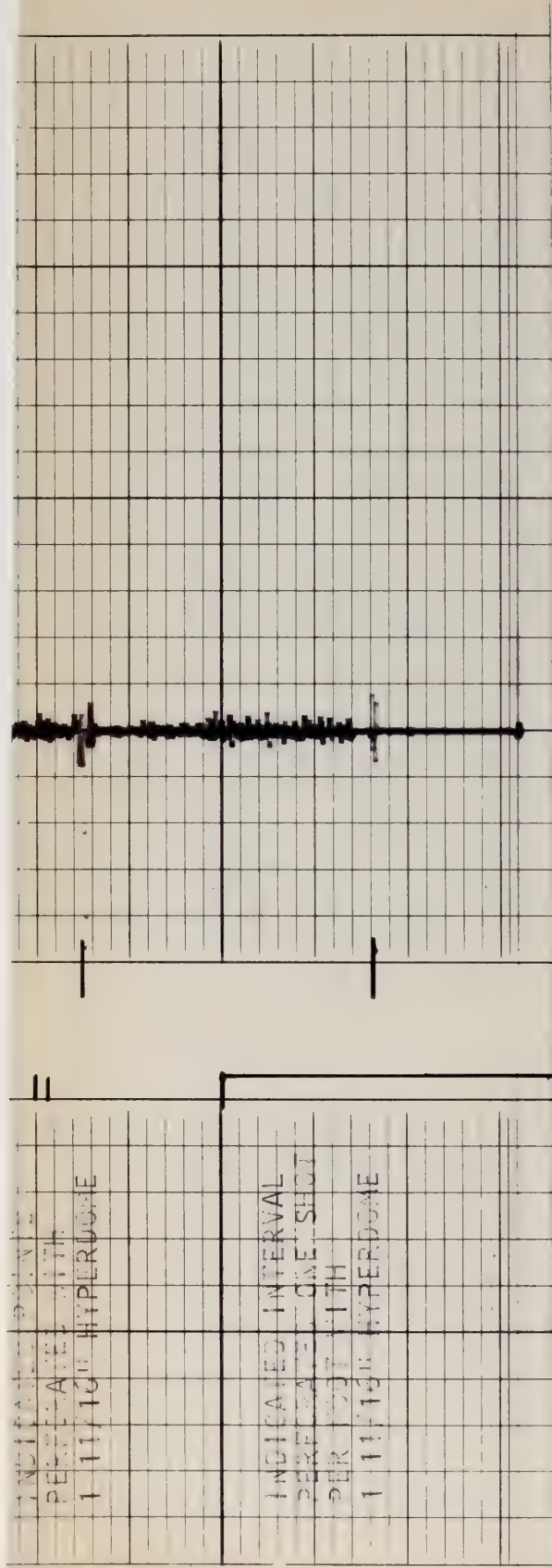




1100

1100

INDICATED POINTS
PERFORATED WITH
1 11/16" HYPERDUR



COMPANY ATLANTIC RICHFIELD COMPANY

WELL S.G. NC.6

FIELD SORGHUM GULCH

RIO BLANCO COLORADO

Schlumberger

PRODUCTION LOGGING SERVICES

Schlumberger

DUAL INDUCTION - LATEROLOG

WITH LINEAR CORRELATION LOG

COUNTY RIO BLANCO, COLO.
FIELD or
LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #6
COMPANY ATLANTIC RICHFIELD

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location. API Serial No. 2523 FSL & 2251 FWL

Sec. 7 Twp. 3S Rge. 96W

Other Services:

BHC-GR-VDL
FDC-CNL-GR
HRT

Permanent Datum: GL; Elev.: 6888
Log Measured From GL, Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B.
D.F.
G.L. 6888

Date	<u>8/23/74</u>						
Run No.	<u>ONE</u>						
Depth—Driller	<u>2220</u>						
Depth—Logger	<u>2220</u>						
Btm. Log Interval	<u>2216</u>						
Top Log Interval	<u>61</u>						
Casing—Driller	<u>8-5/8</u>	<u>@</u>	<u>59</u>	<u>@</u>	<u>@</u>	<u>@</u>	<u>@</u>
Casing—Logger	<u>61</u>						
Bit Size	<u>6-1/4</u>						
Type Fluid in Hole	<u>WATER</u>						
Fluid Level	<u>466</u>						
Dens.	Visc.	<u>—</u>	<u>—</u>				
pH	Fluid Loss	<u>—</u>	<u>—</u> ml	<u>—</u> ml	<u>—</u> ml	<u>—</u> ml	<u>—</u> ml
Source of Sample	<u>PIT</u>						
R _m @ Meas. Temp.	<u>5.04</u>	<u>@</u>	<u>88</u> °F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F
R _{mf} @ Meas. Temp.	<u>@</u>	<u>@</u>	°F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F
R _{mc} @ Meas. Temp.	<u>@</u>	<u>@</u>	°F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F
Source: R _{mf}	R _{mc}						
R _m @ BHT	<u>@</u>	<u>@</u>	°F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F	<u>@</u> °F
Time Since Circ.	<u>1-1/2 HOURS</u>						
Max. Rec. Temp.	<u>110</u>	<u>°F</u>		<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>
Equip.	Location	<u>5602</u>	<u>GJ</u>				
Recorded By	<u>BARGHOUTI</u>						
Witnessed By	<u>ELLARDI, TAIT</u>						

The well name, location and borehole reference data were furnished by the customer.

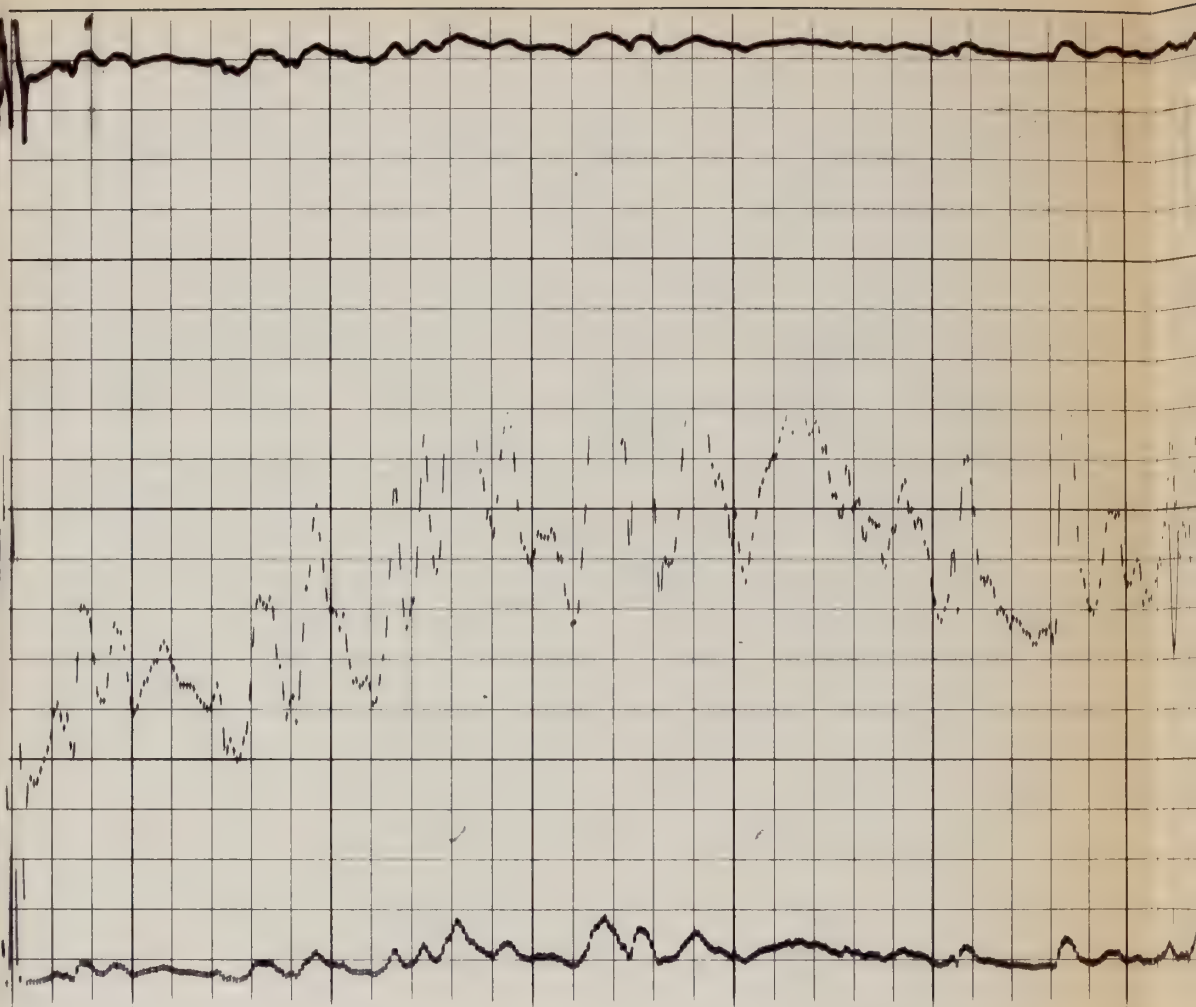
[illegible]

CALIBRATION:	BACKGND.	SOURCE	GALV. INCR.	SENS. TAP	SENS. TAP	TIME
	CPS.	CPS.	DIVISION	(FOR CAL.)	(RECORD)	CONST.
GAMMA RAY:						

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

SPONTANEOUS-POTENTIAL MILLIVOLTS <div style="text-align: center;"> $- \left \begin{array}{c} 15 \\ \longleftrightarrow \\ MV \end{array} \right +$ </div>		CONDUCTIVITY $\text{MILLIMHOS/M} = \frac{1000}{\text{OHMS. M}^2/\text{M}}$	
		DEEP INDUCTION LOG <div style="display: flex; justify-content: space-between;"> 400 200 0 </div>	
		RESISTIVITY OHMS. M ² /M	
		DEEP INDUCTION LOG <div style="display: flex; justify-content: space-between;"> 0 100 </div>	
		<div style="display: flex; justify-content: space-between;"> 0 1000 </div>	
		AVERAGED LATEROLOG - 8 <div style="display: flex; justify-content: space-between;"> 0 100 </div>	
		<div style="display: flex; justify-content: space-between;"> 0 1000 </div>	

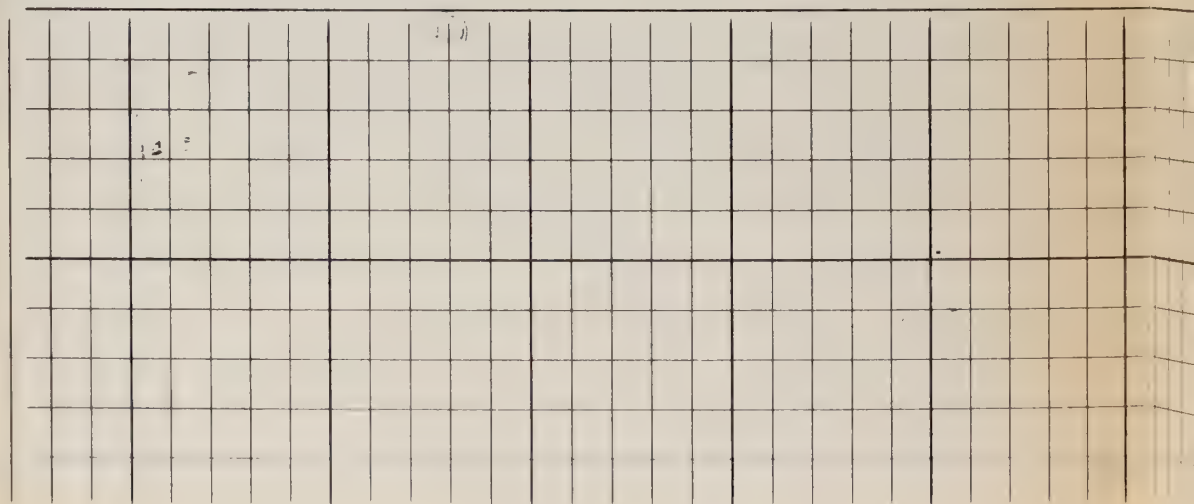
Casing



0100

0200

0300

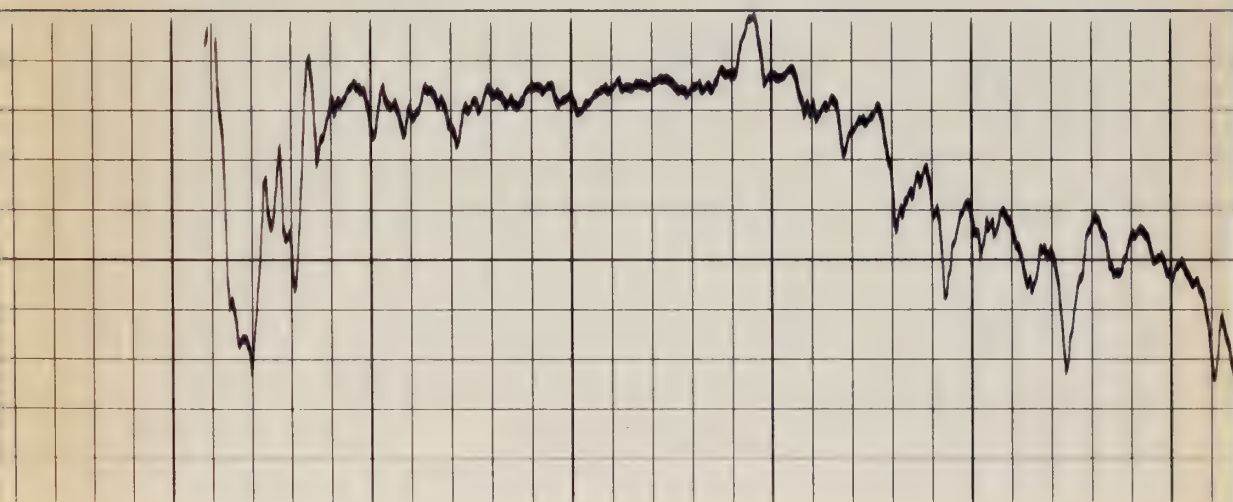


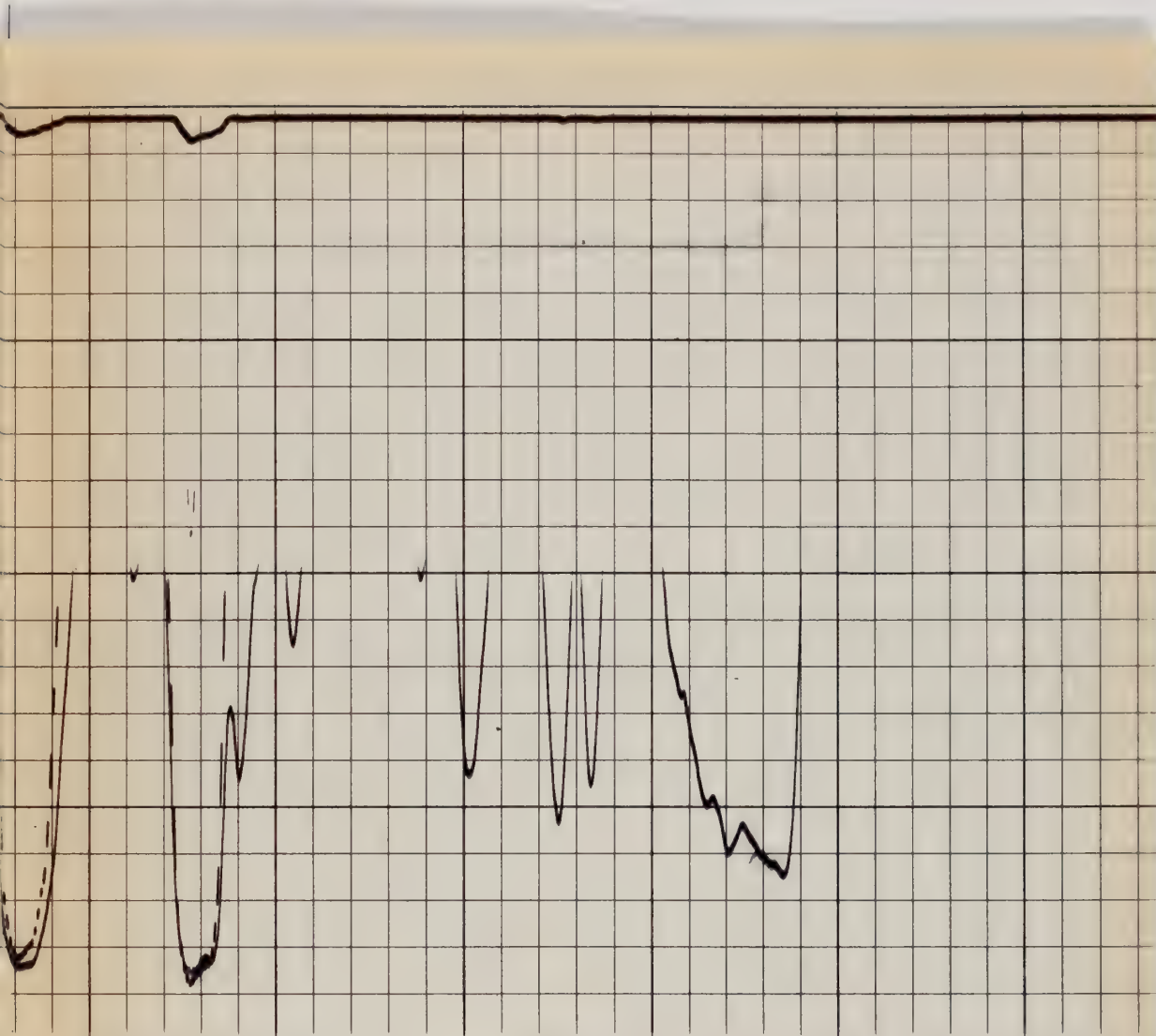


0400

0500

0600

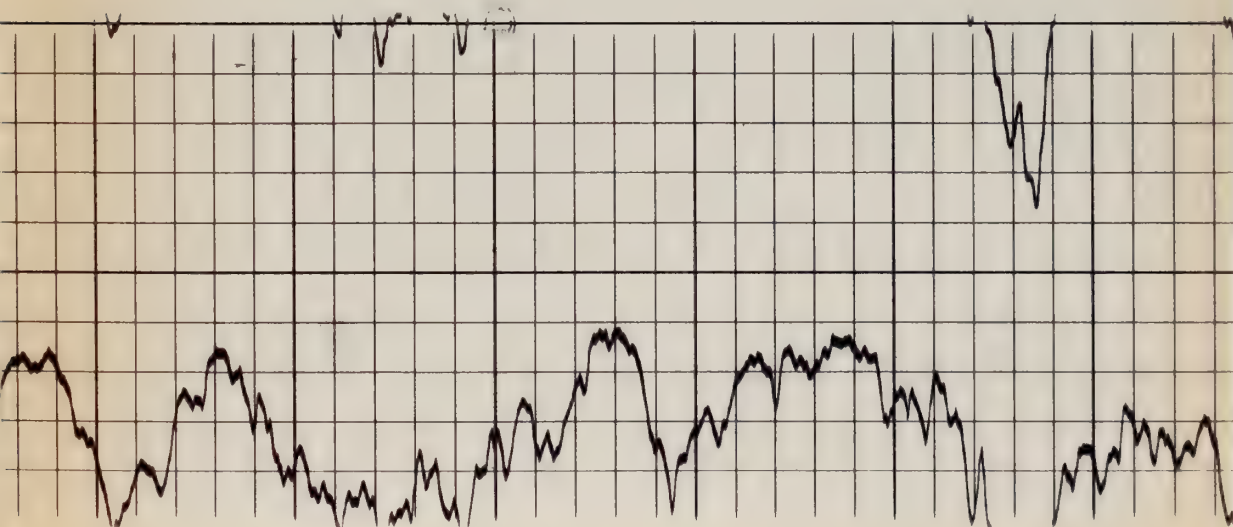


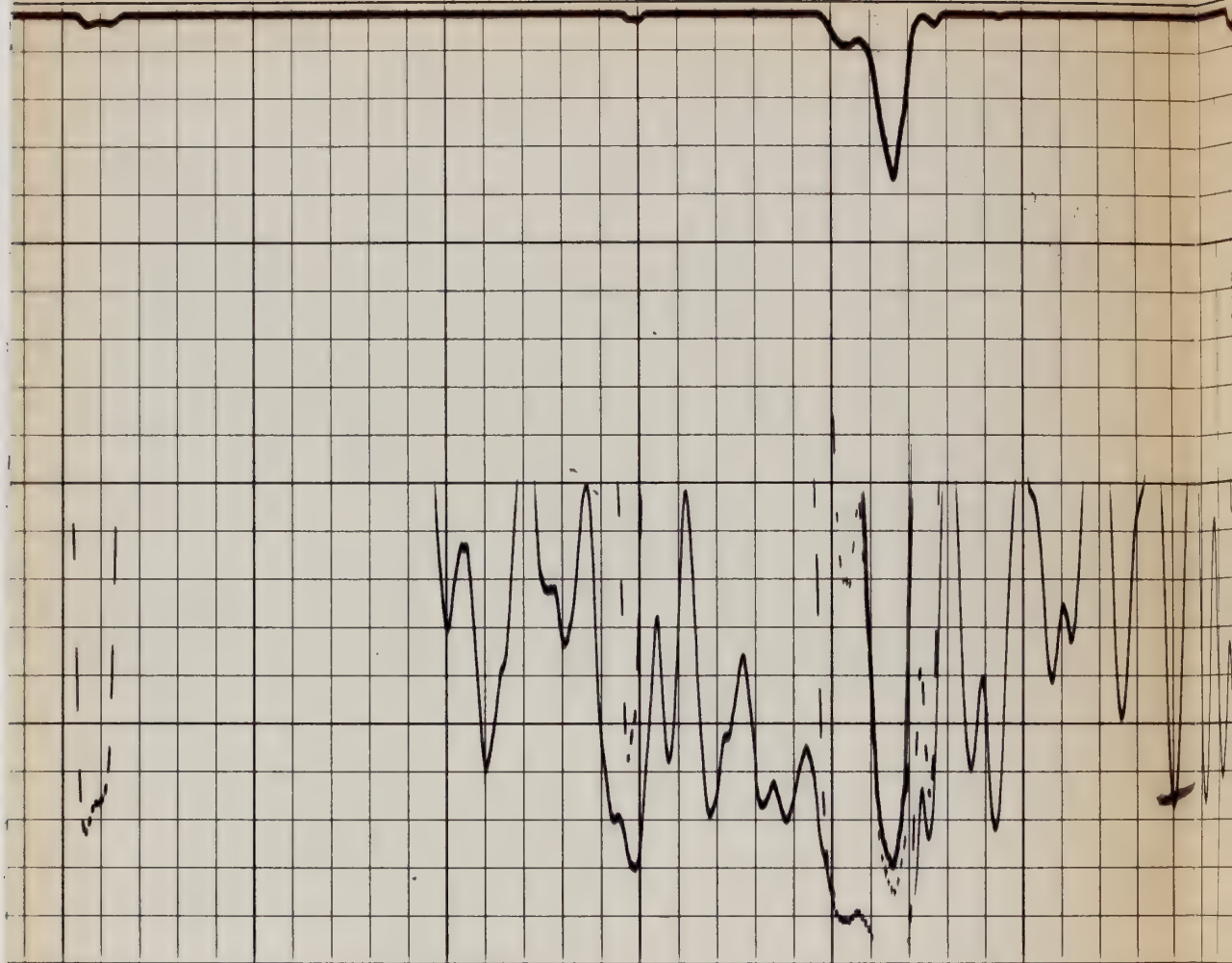


1000

1100

1200



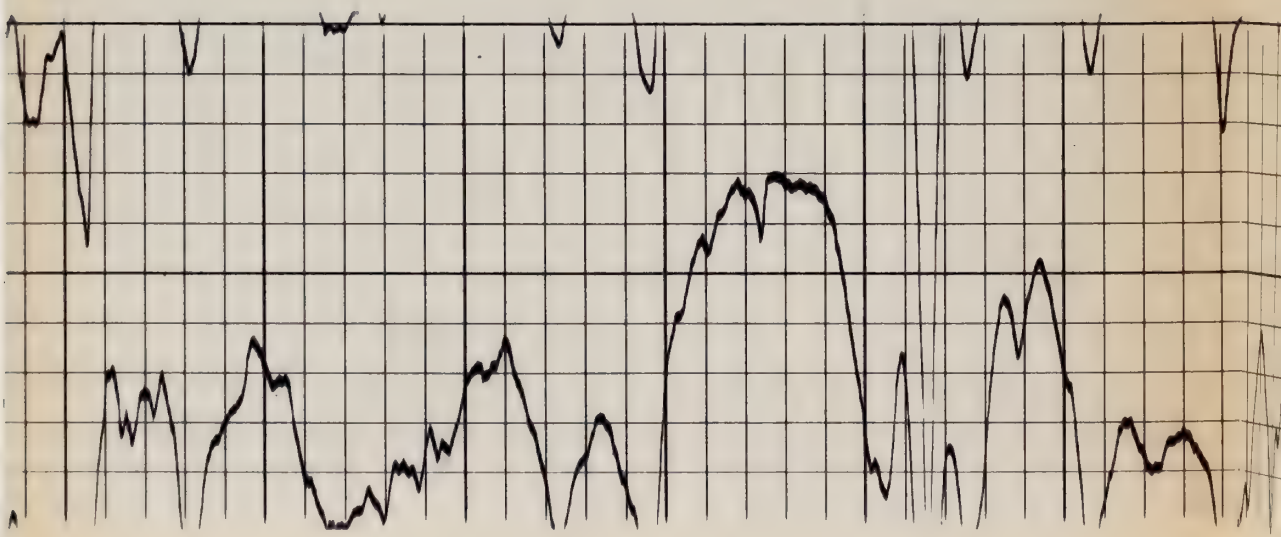


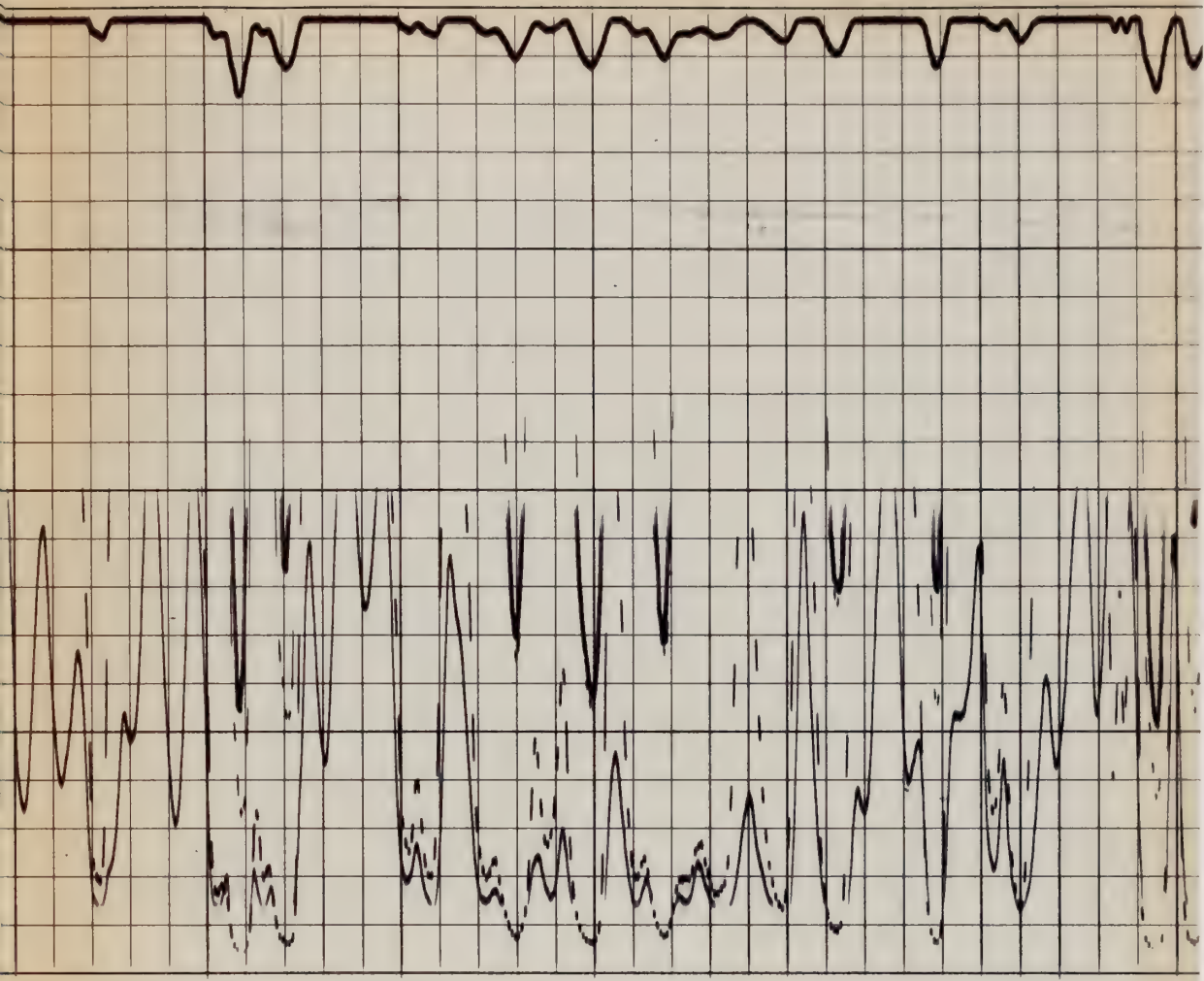
1300

1400

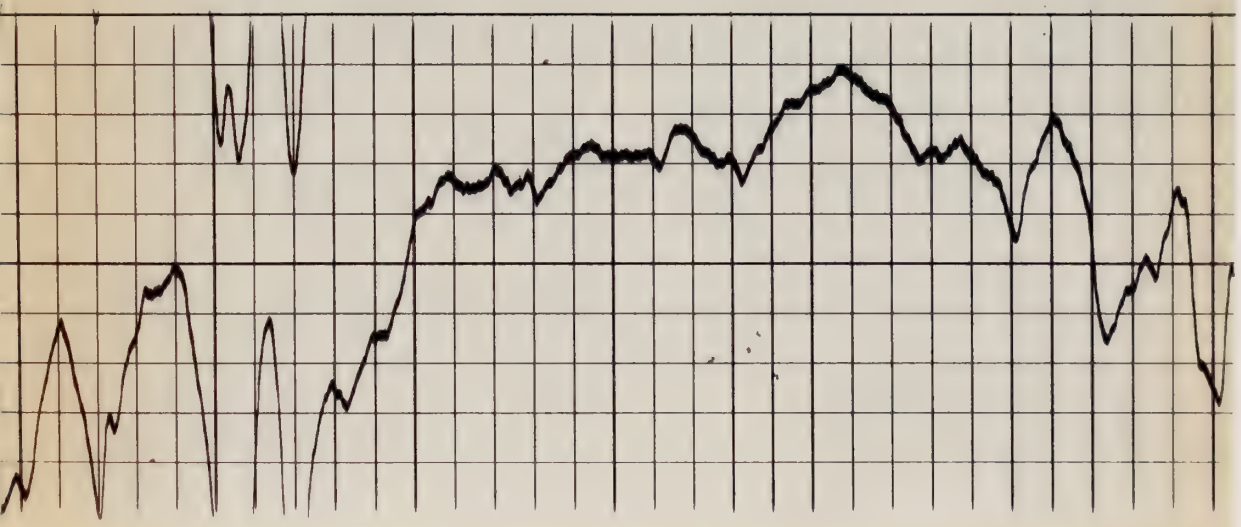
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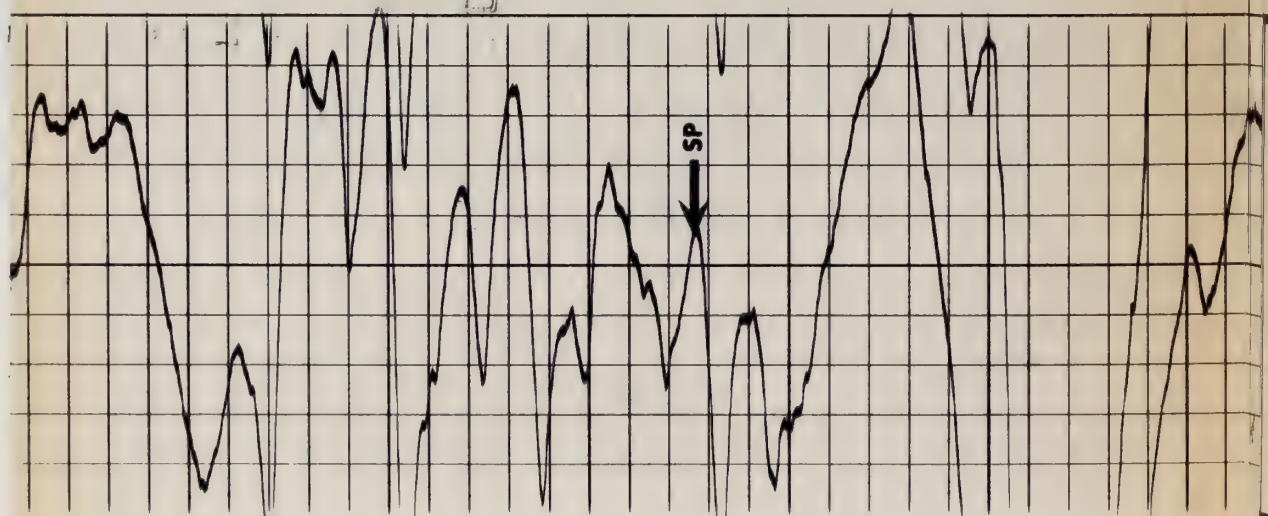
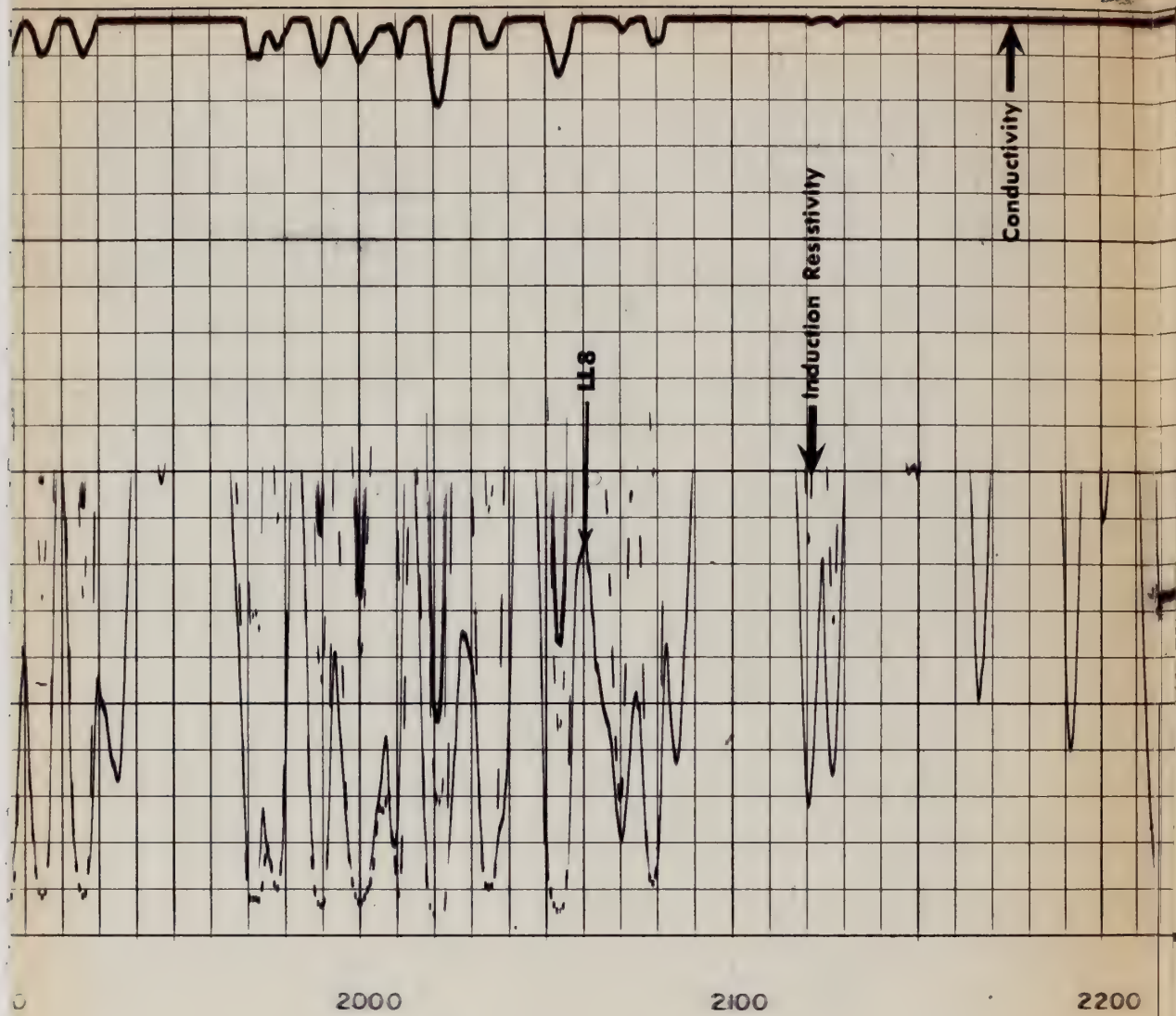
1600





600 1700 1800 1900





一

S

— — 15 MV — — +

DEEP INDUCTION LOG

0.2 1.0 100 1000 2000

MEDIUM INDUCTION LOG

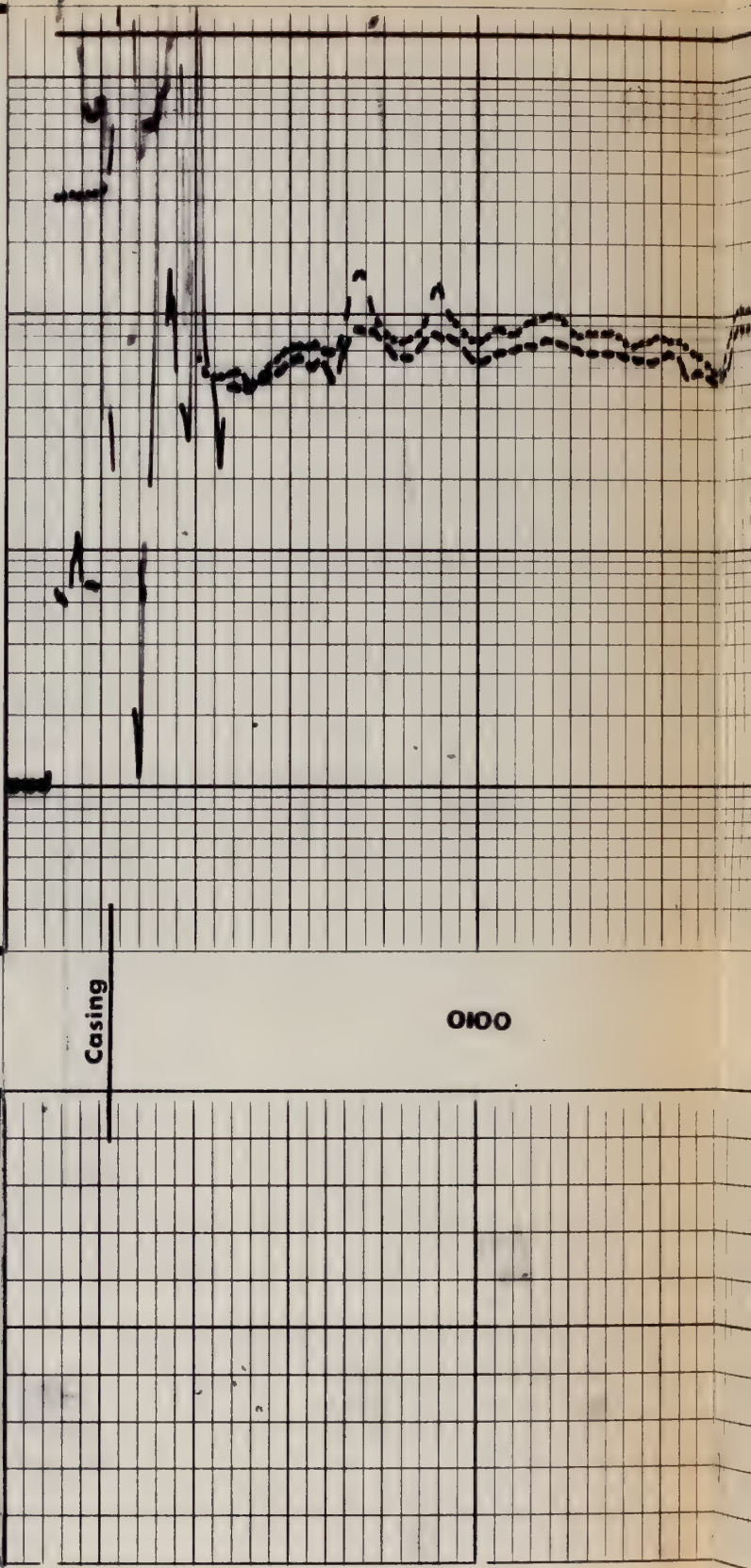
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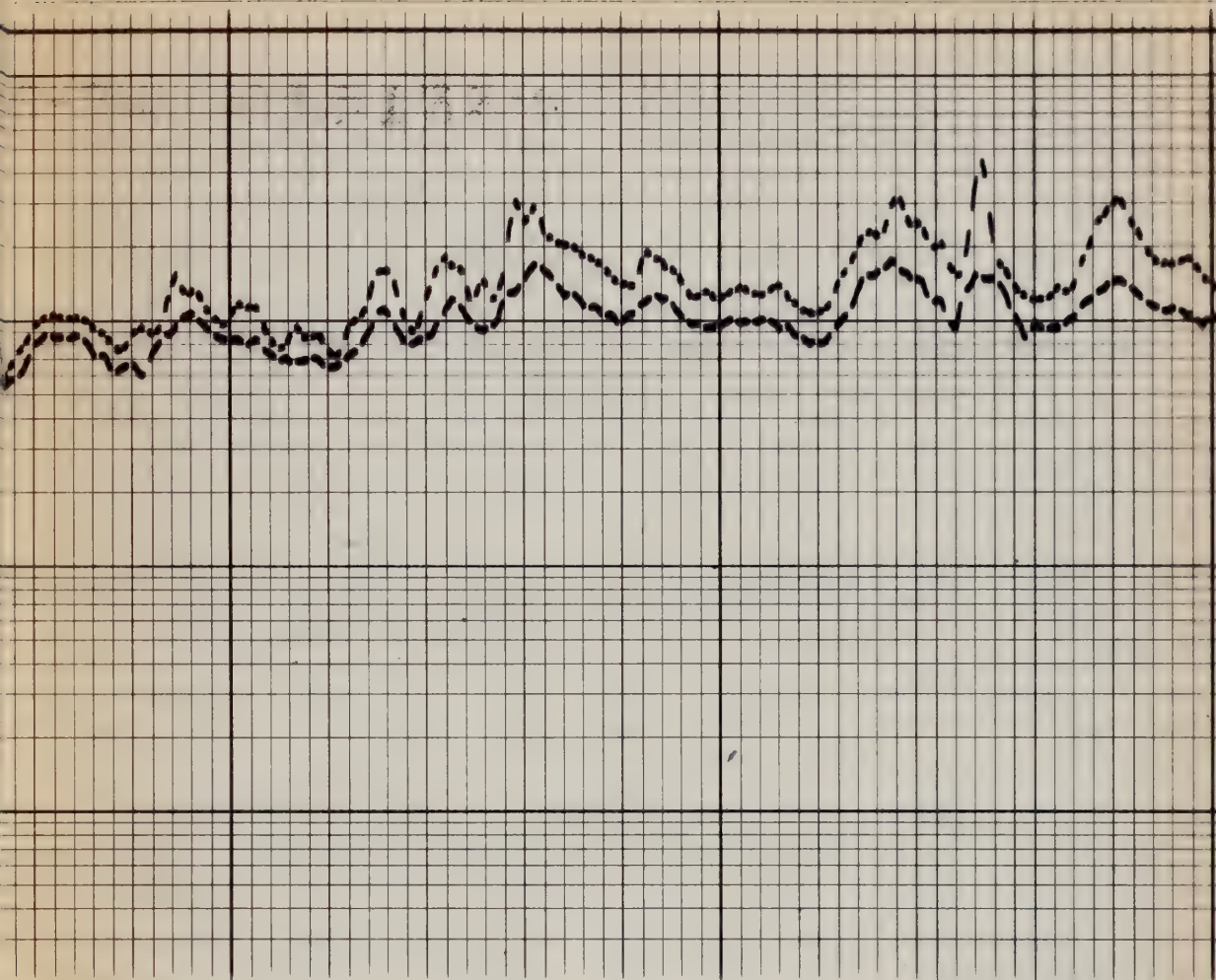
LATEROLOG - 8

0.2 1.0 100 1000 2000

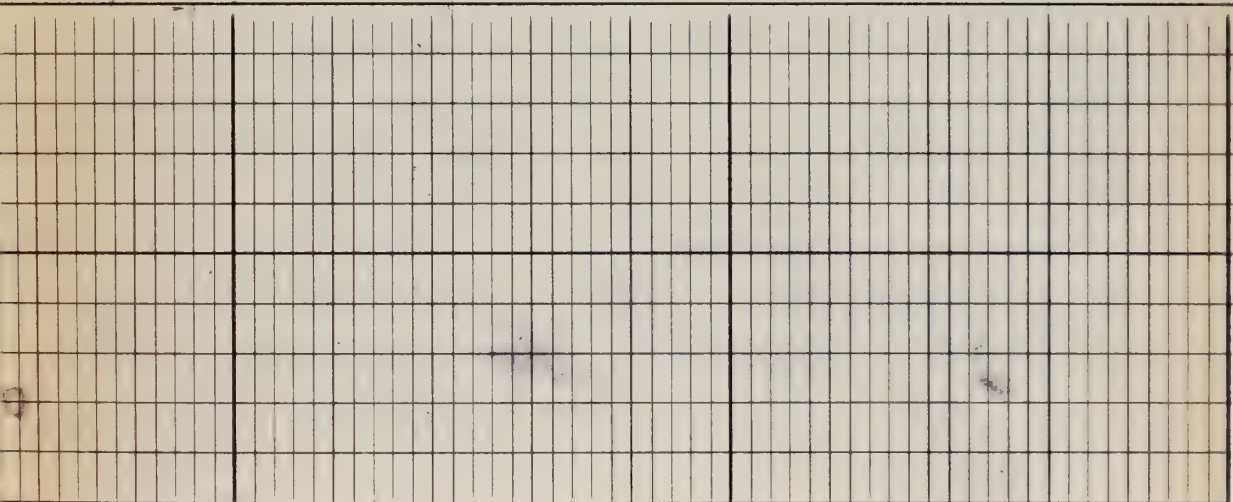
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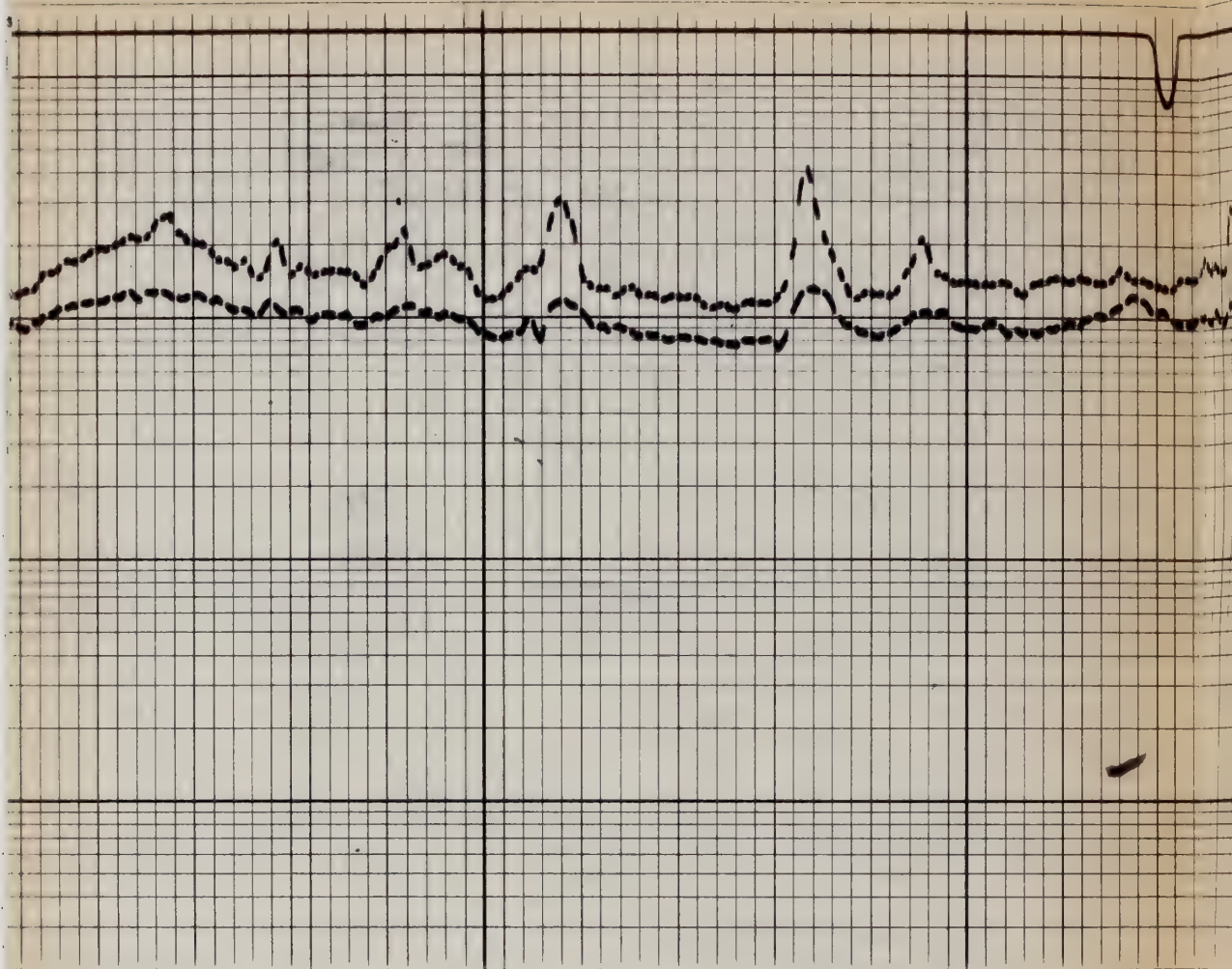
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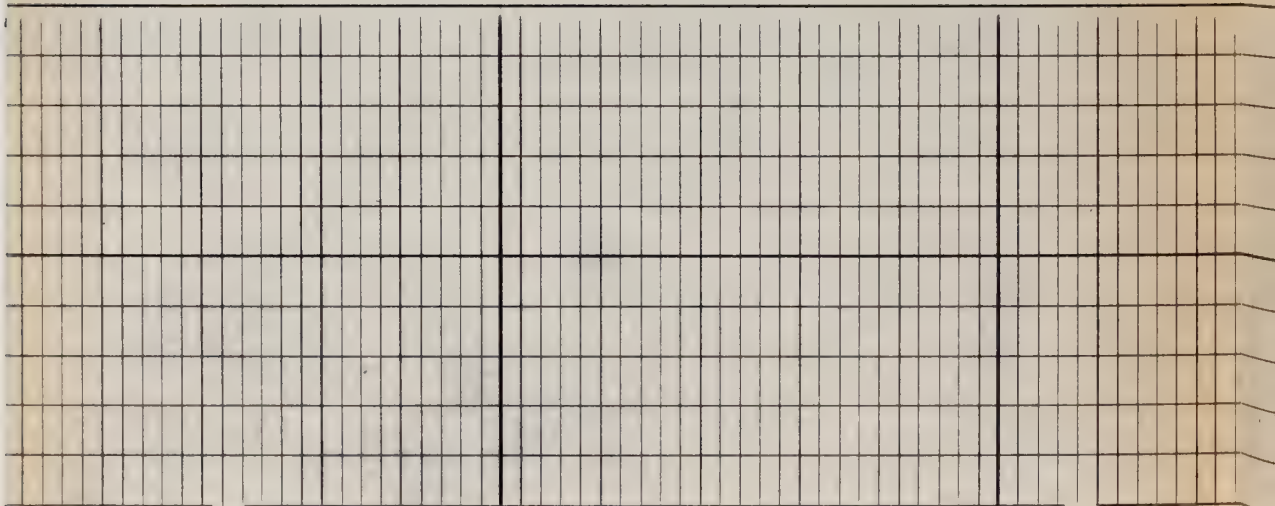


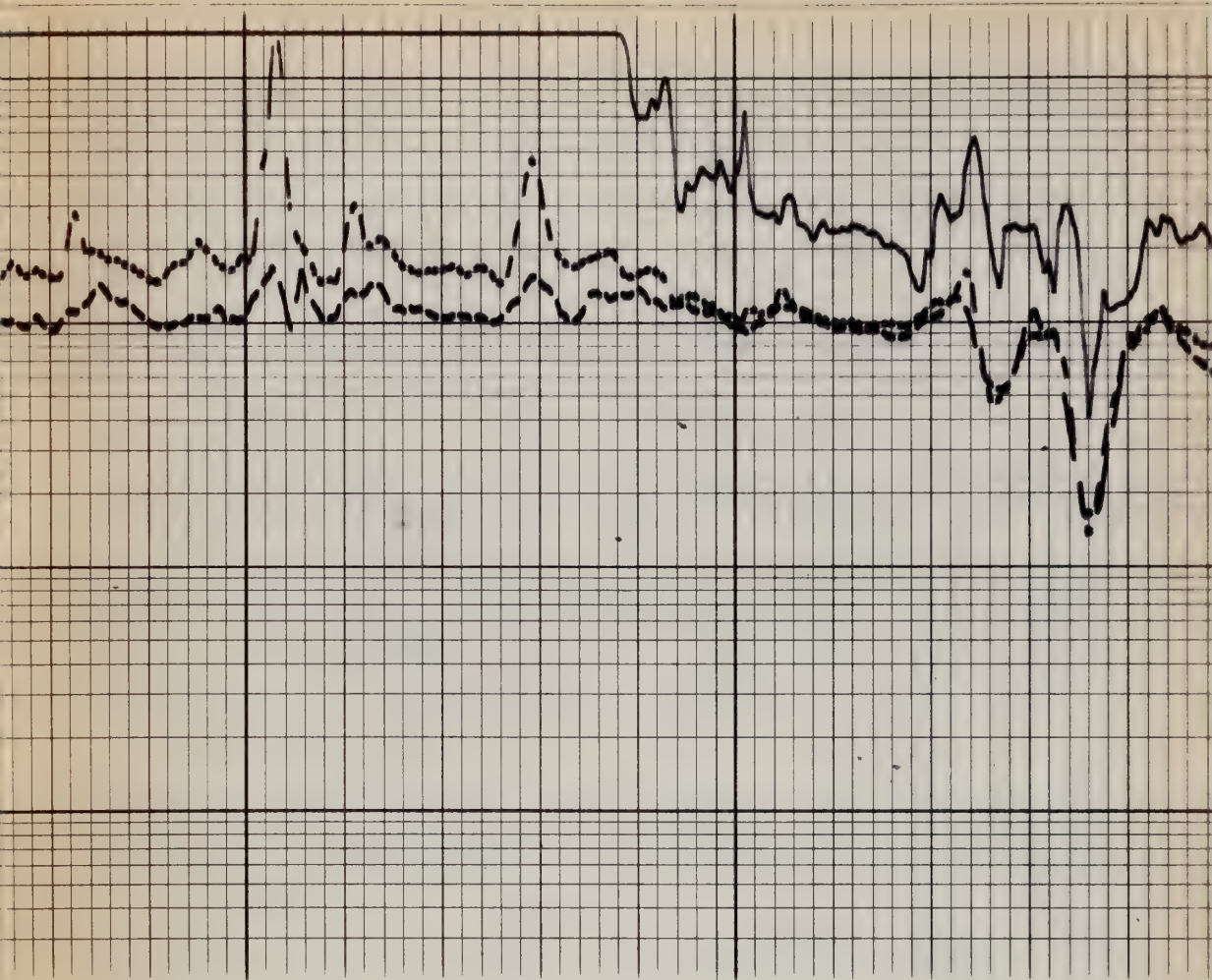
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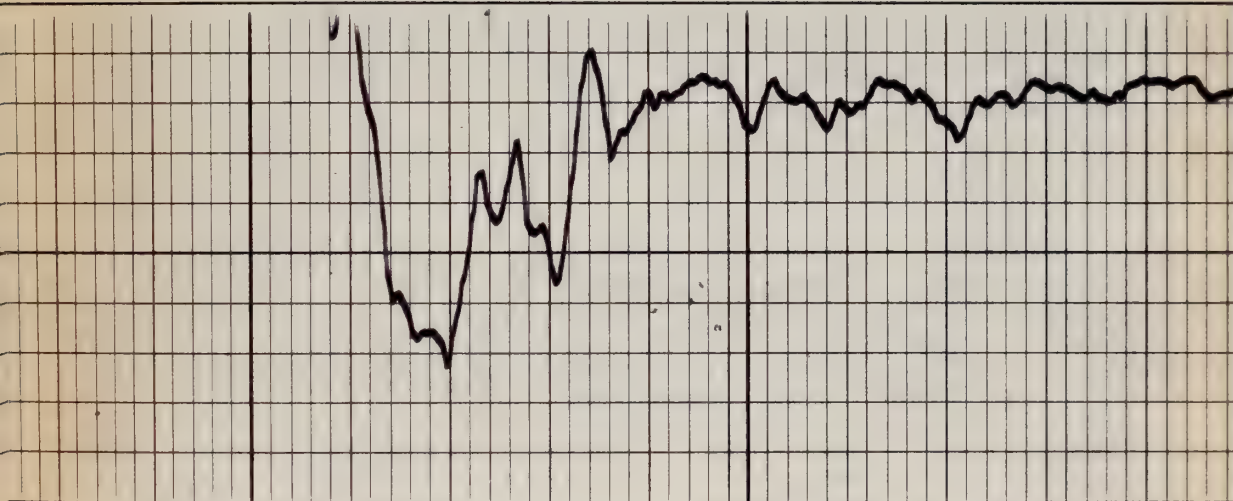
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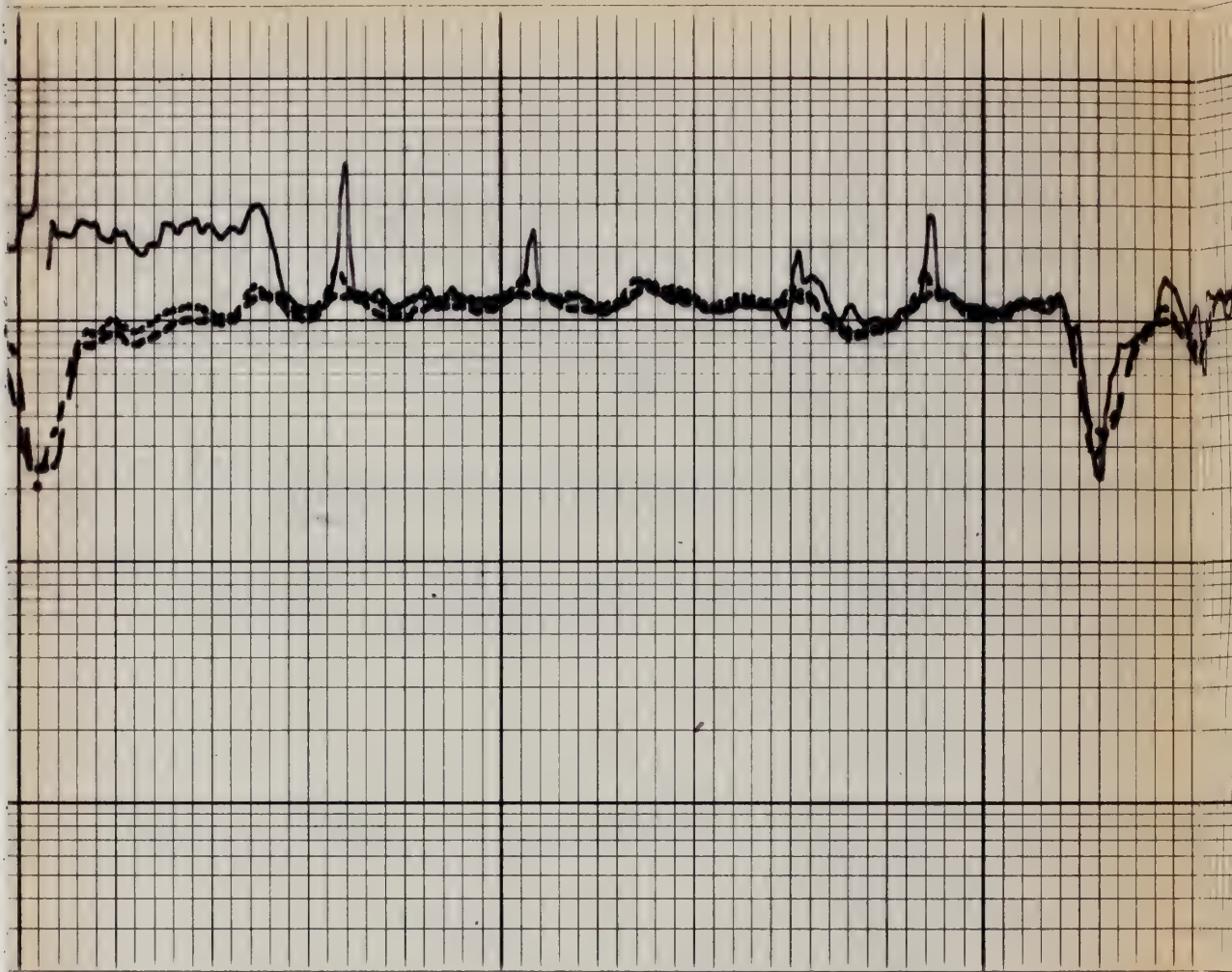




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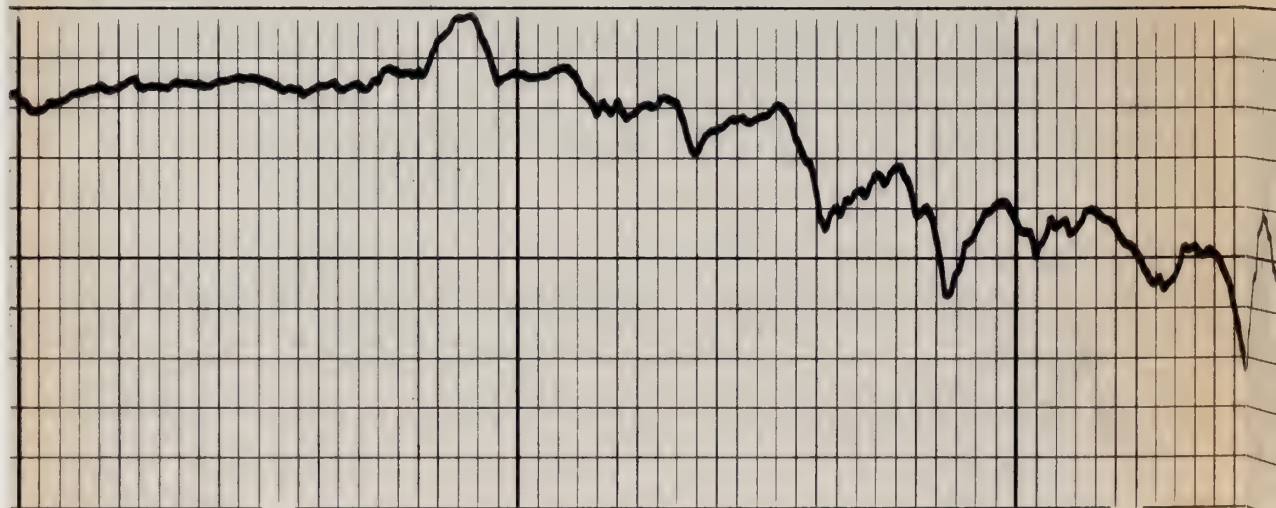
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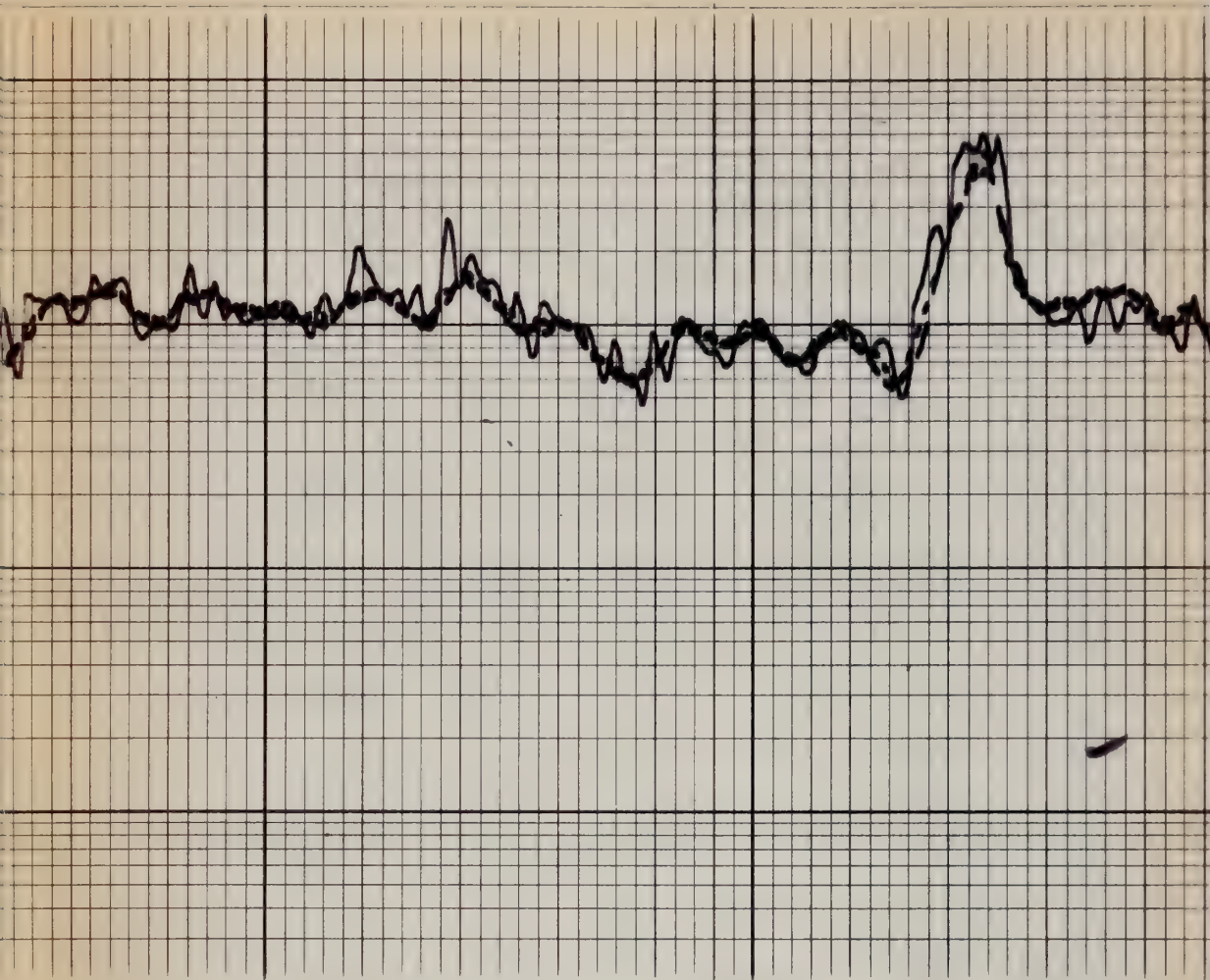




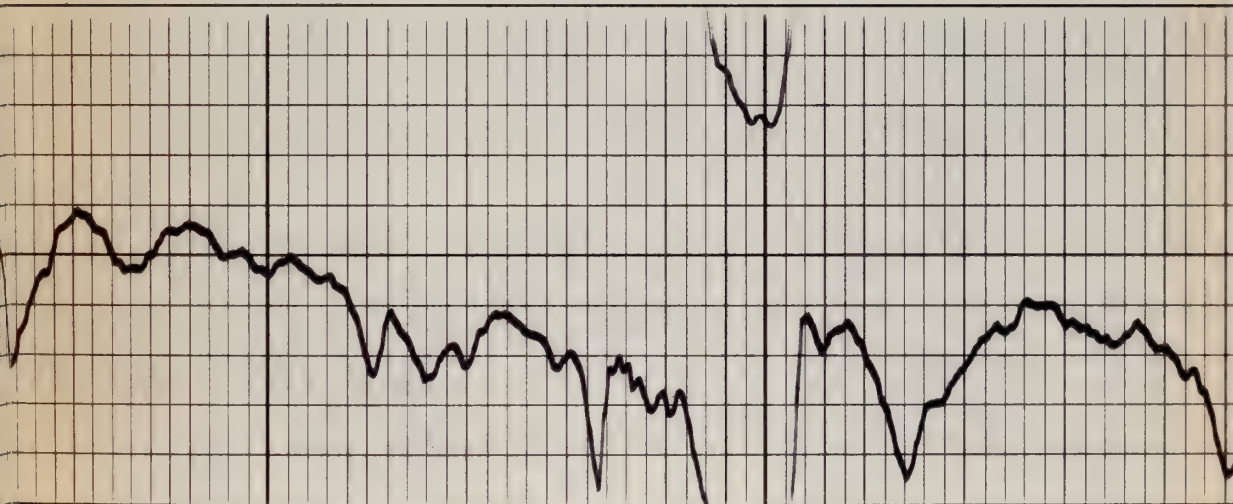
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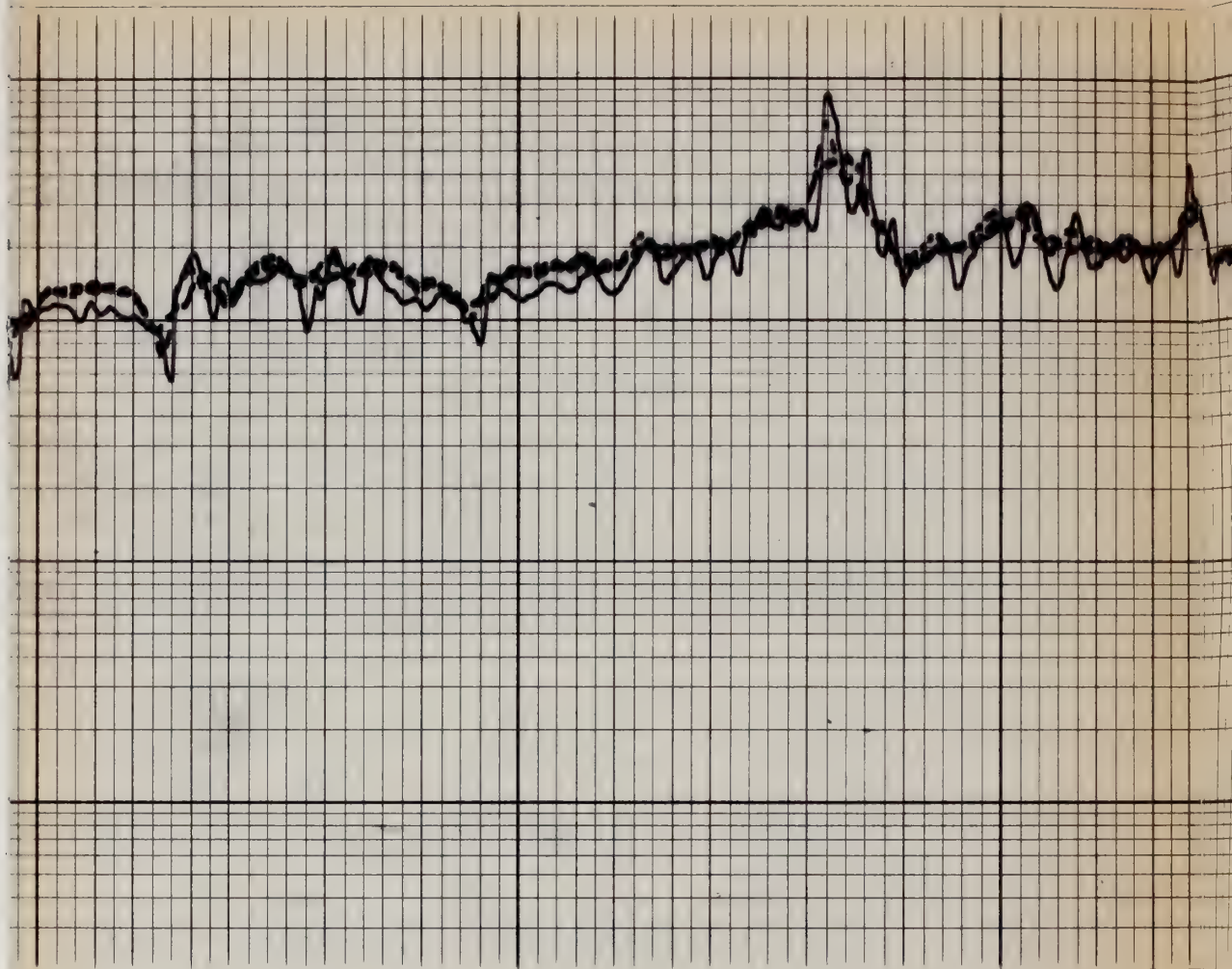
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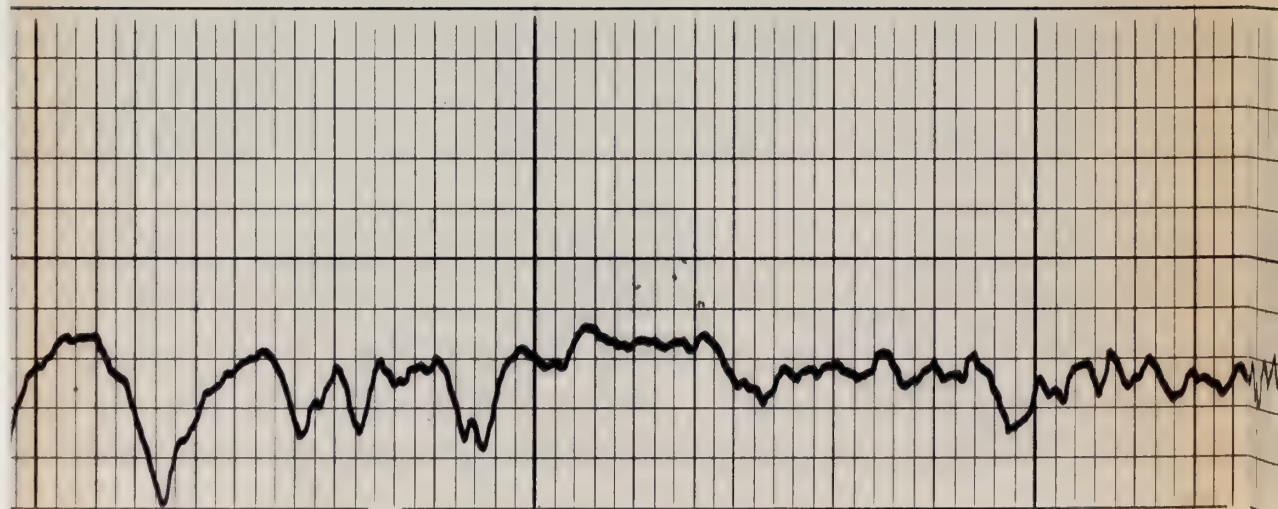


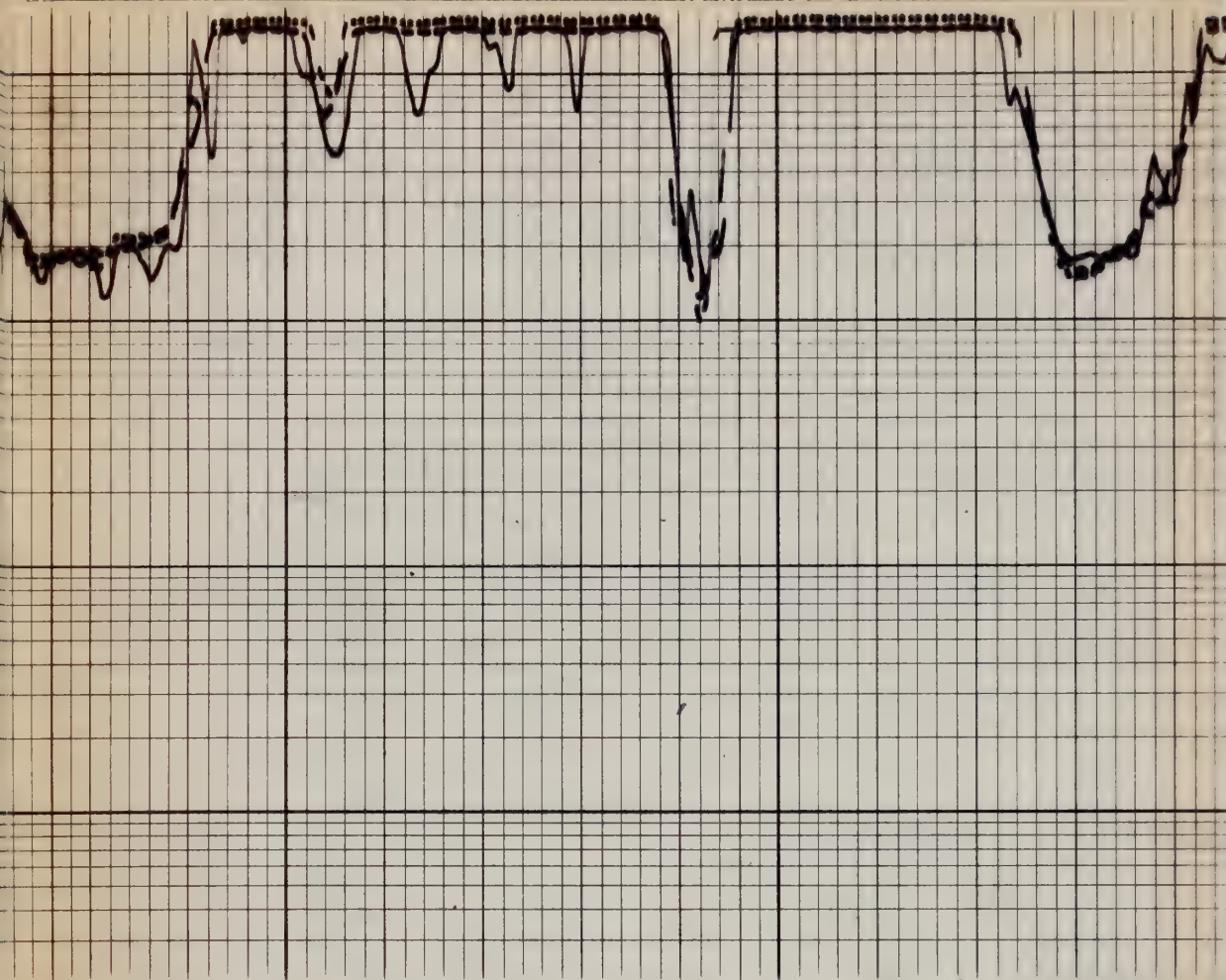
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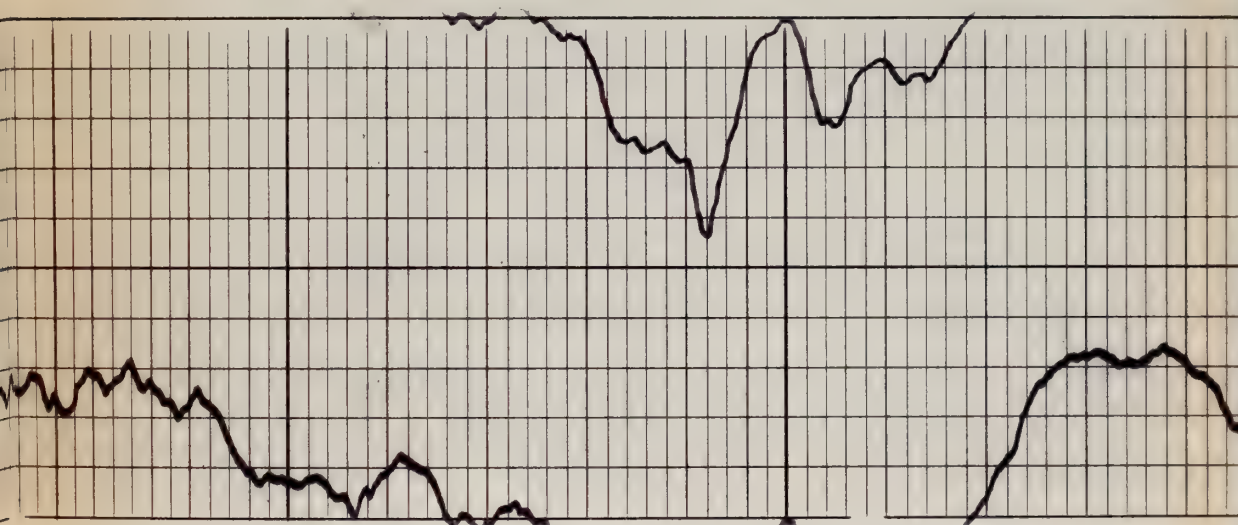


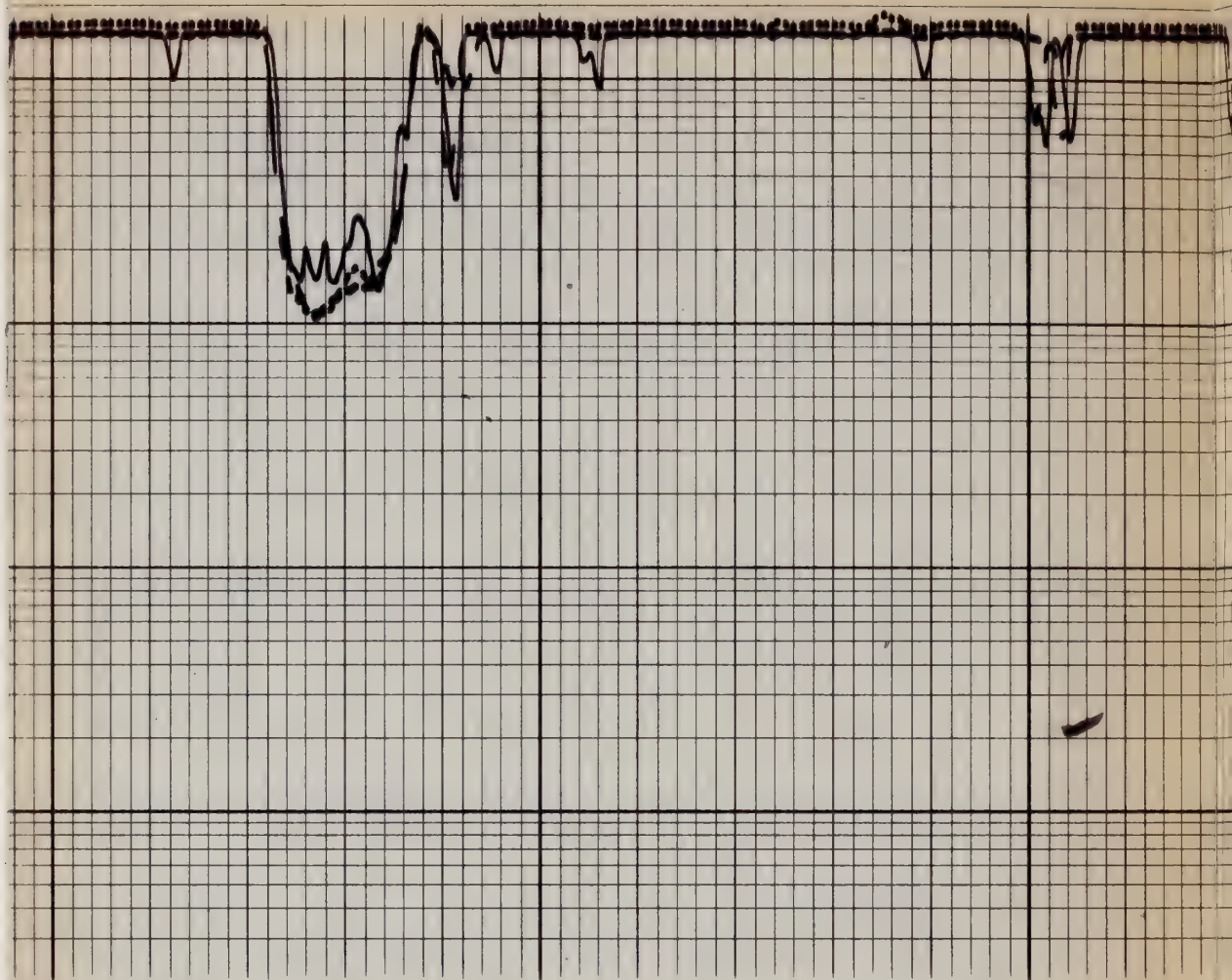
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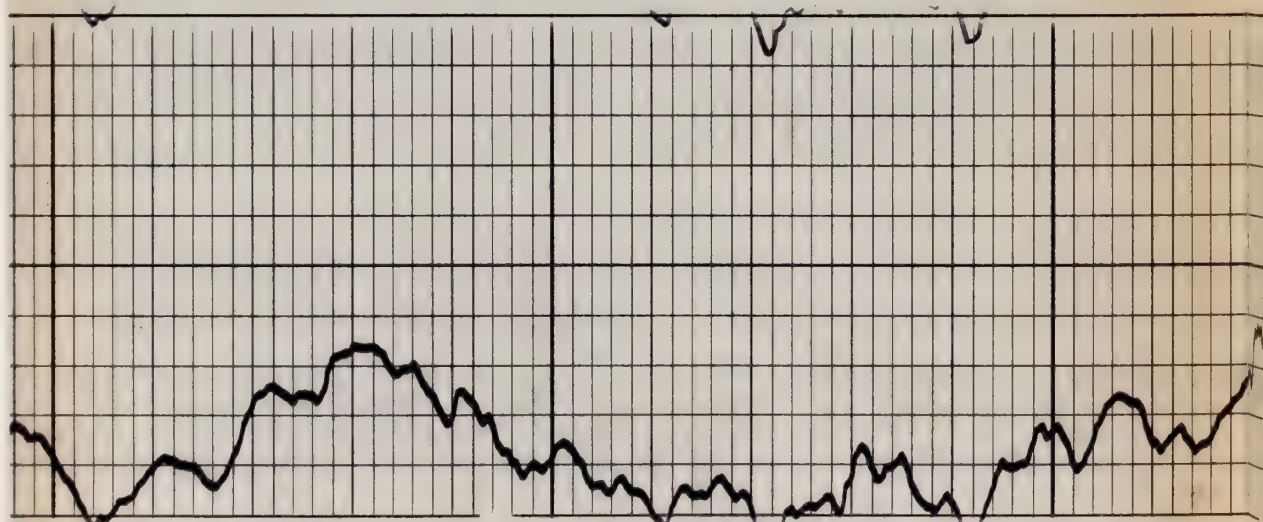
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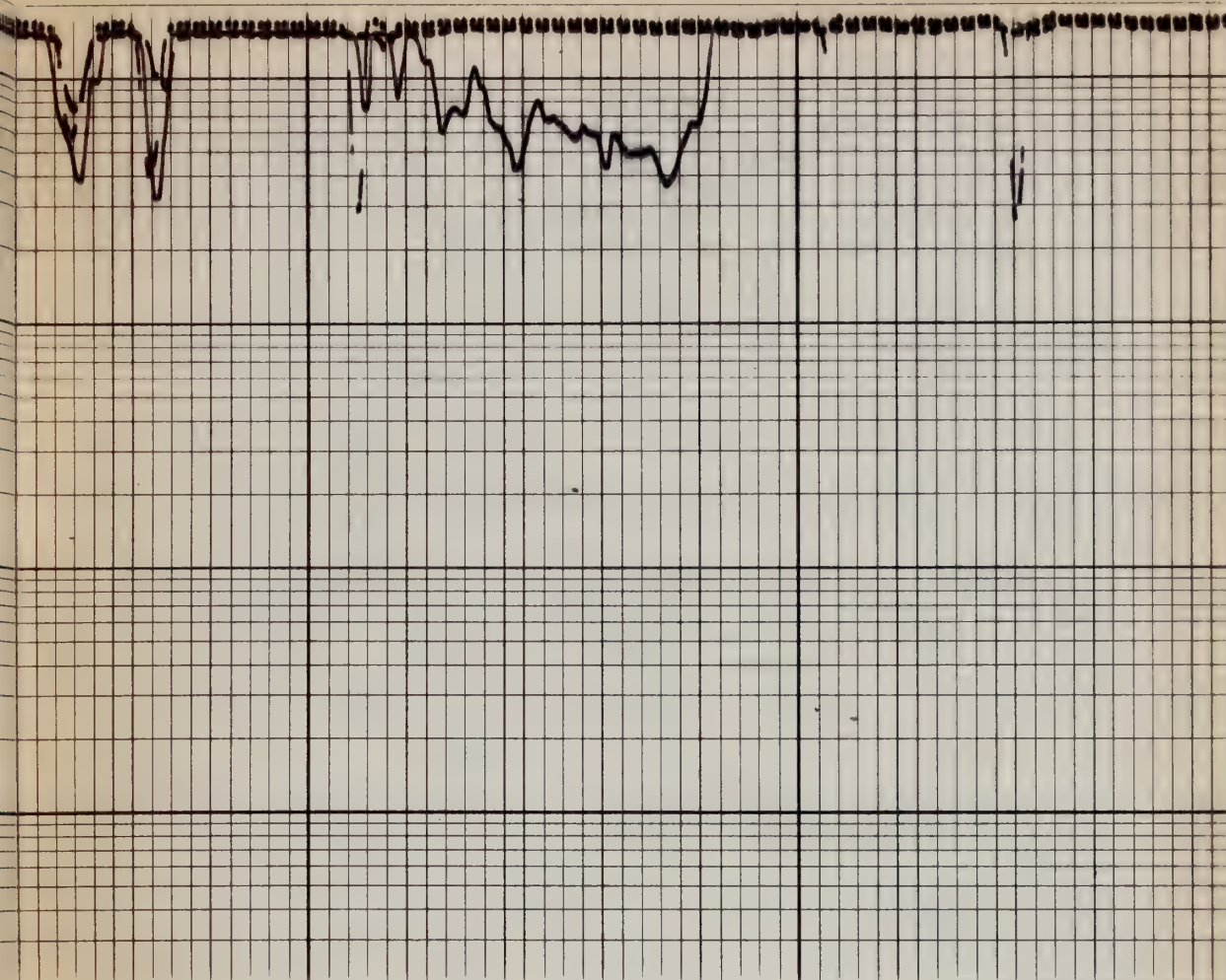




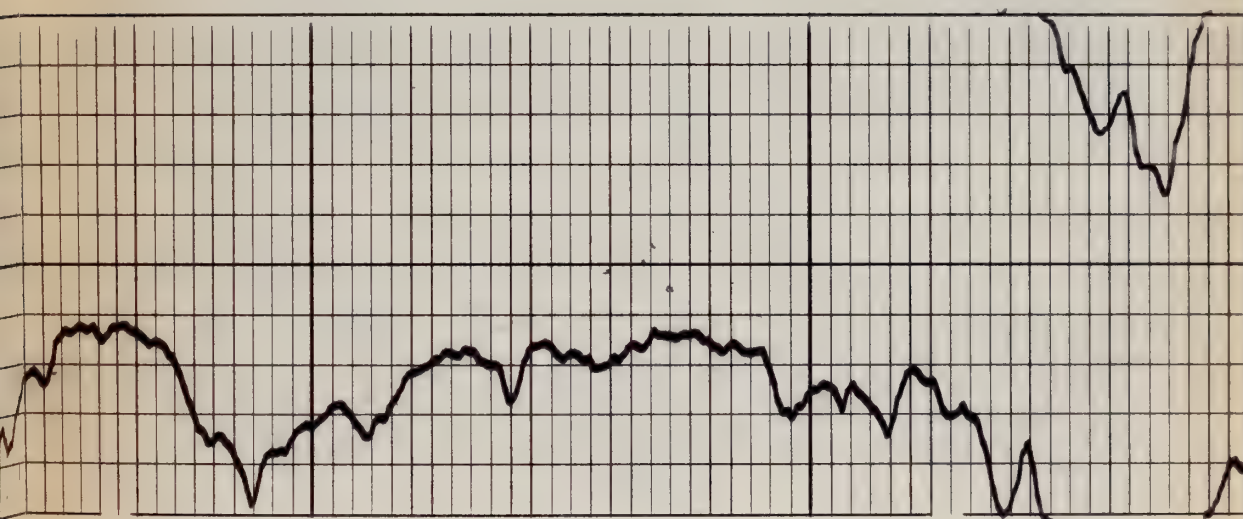
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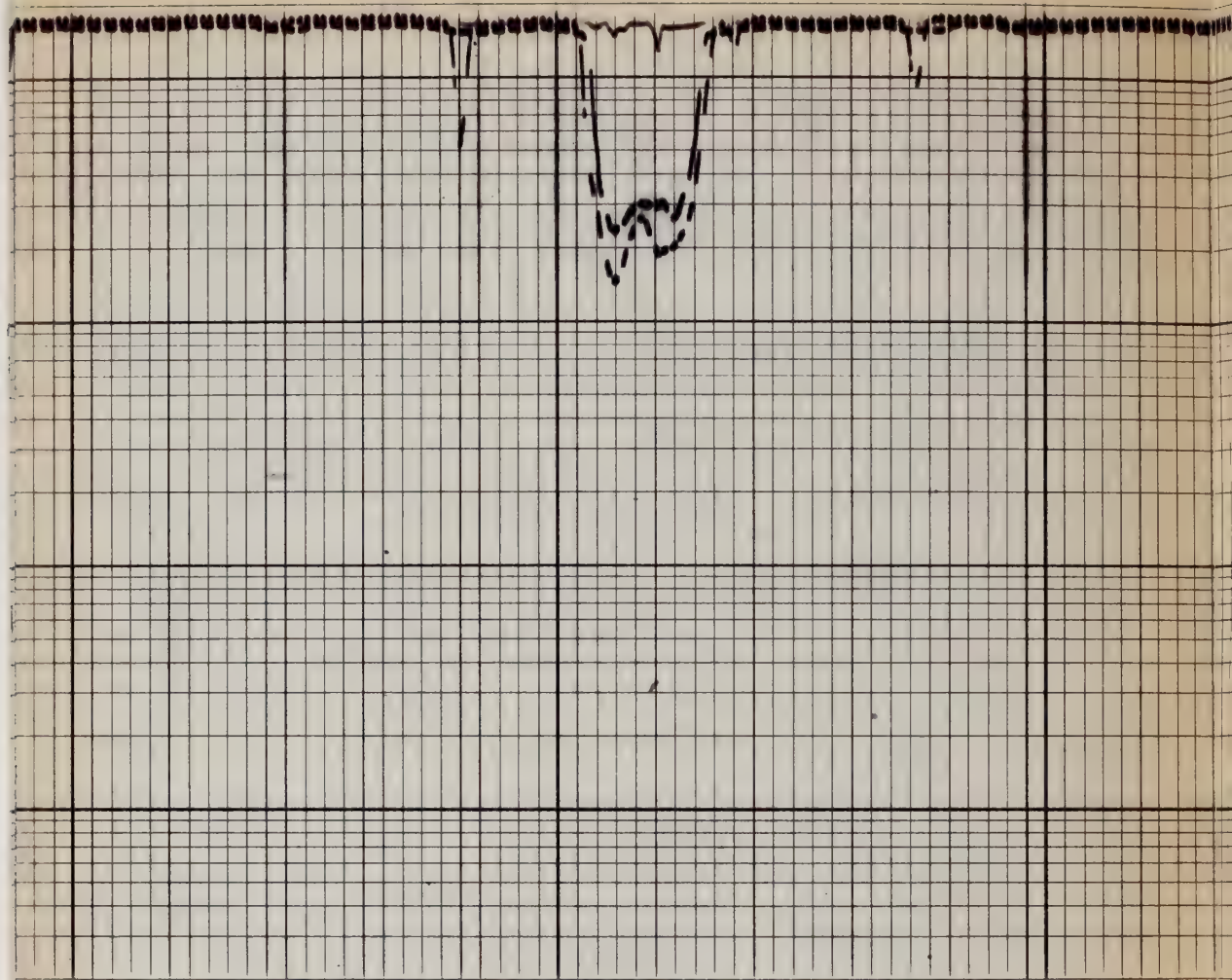
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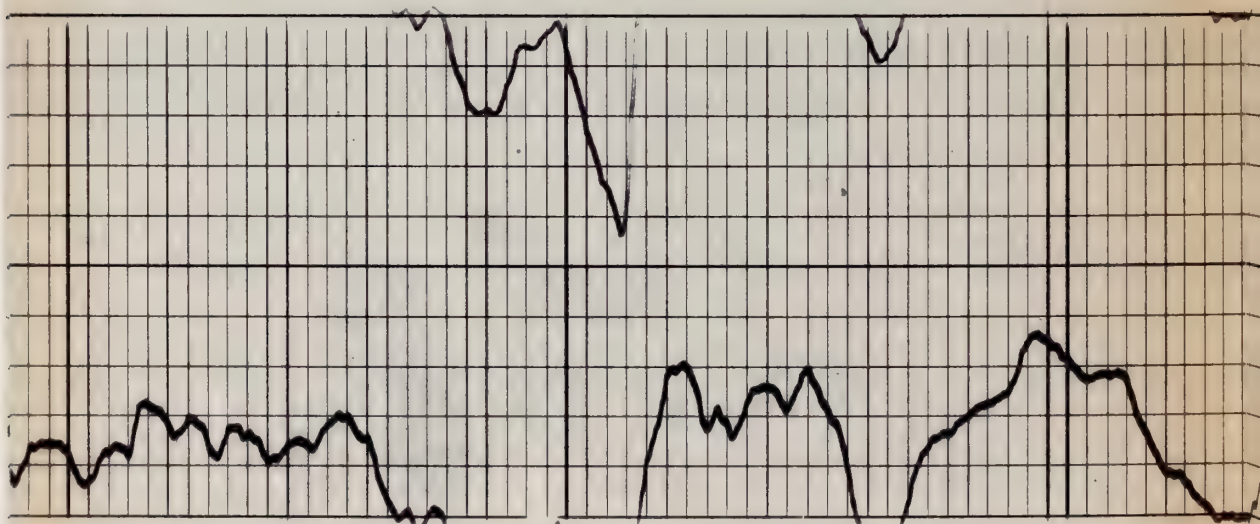


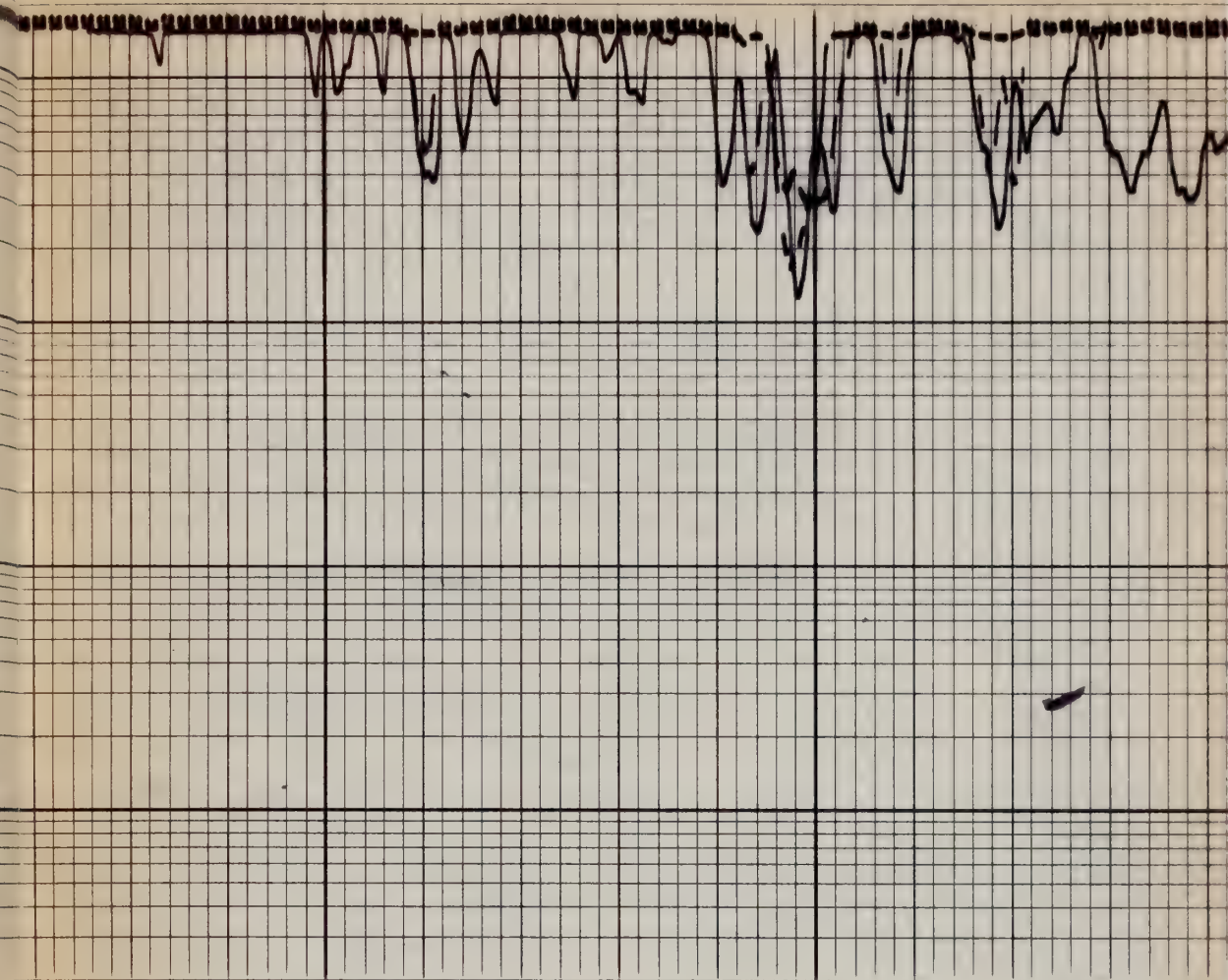
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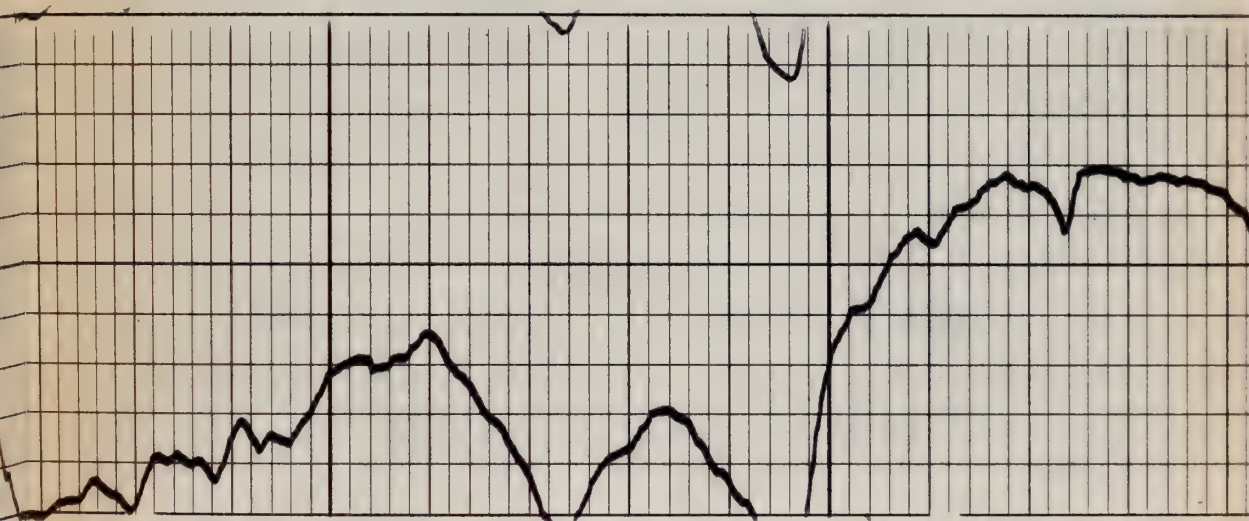


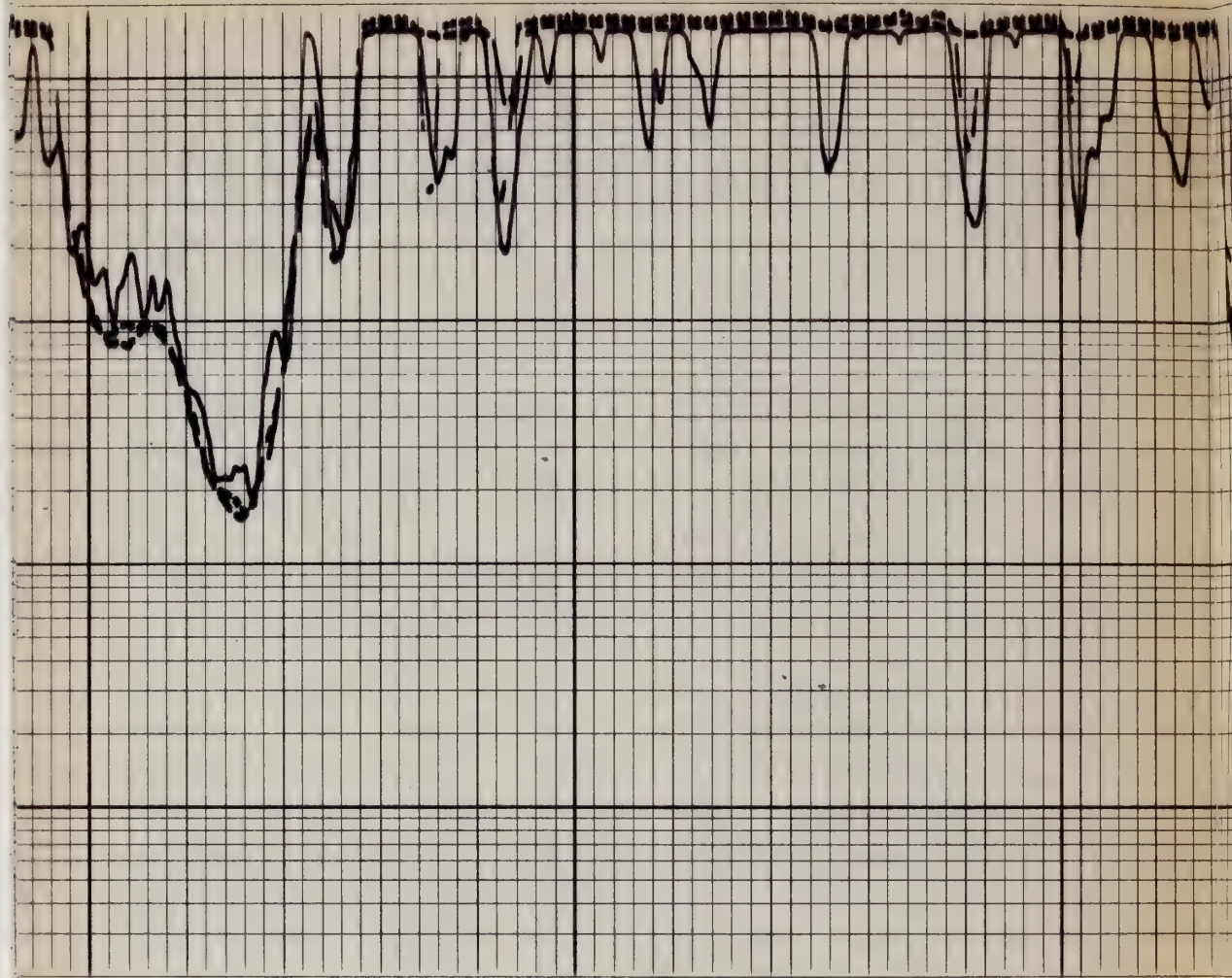
300





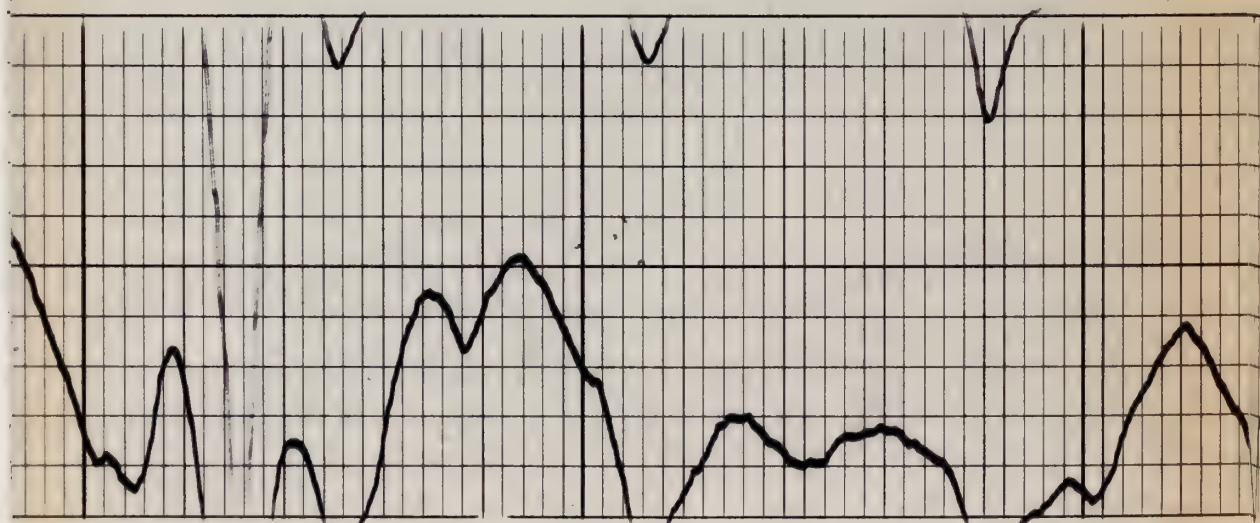
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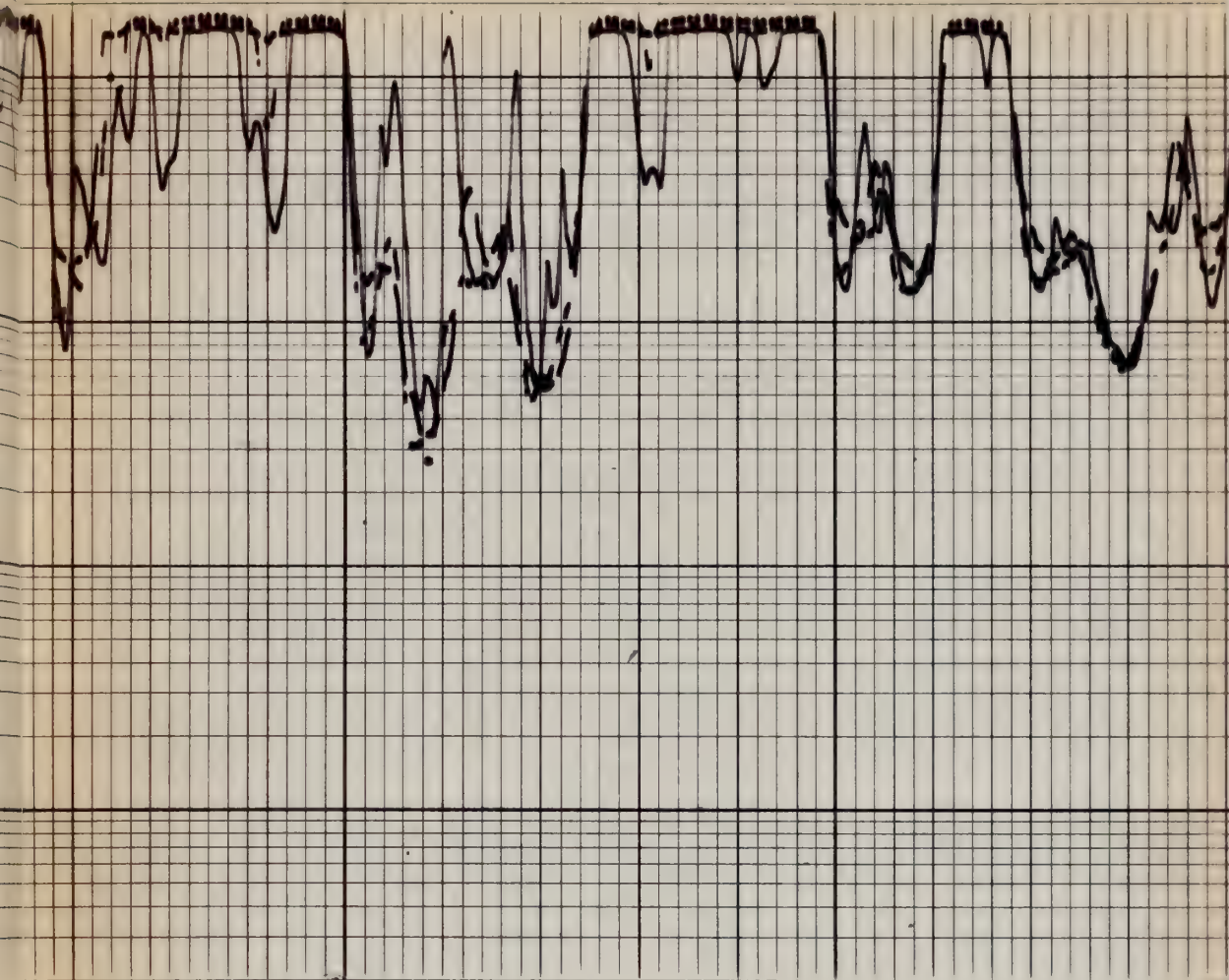




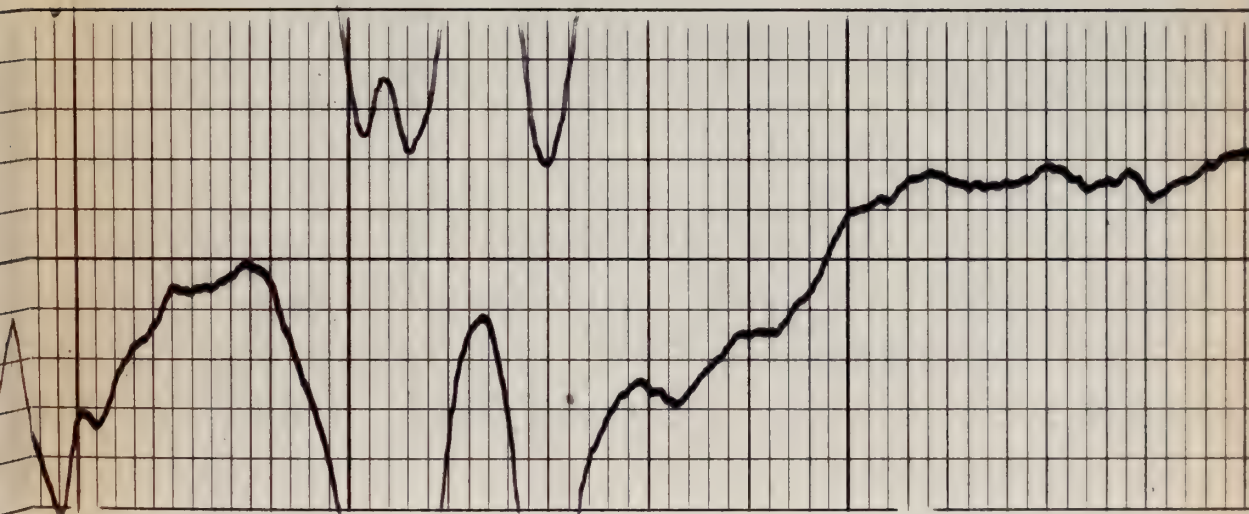
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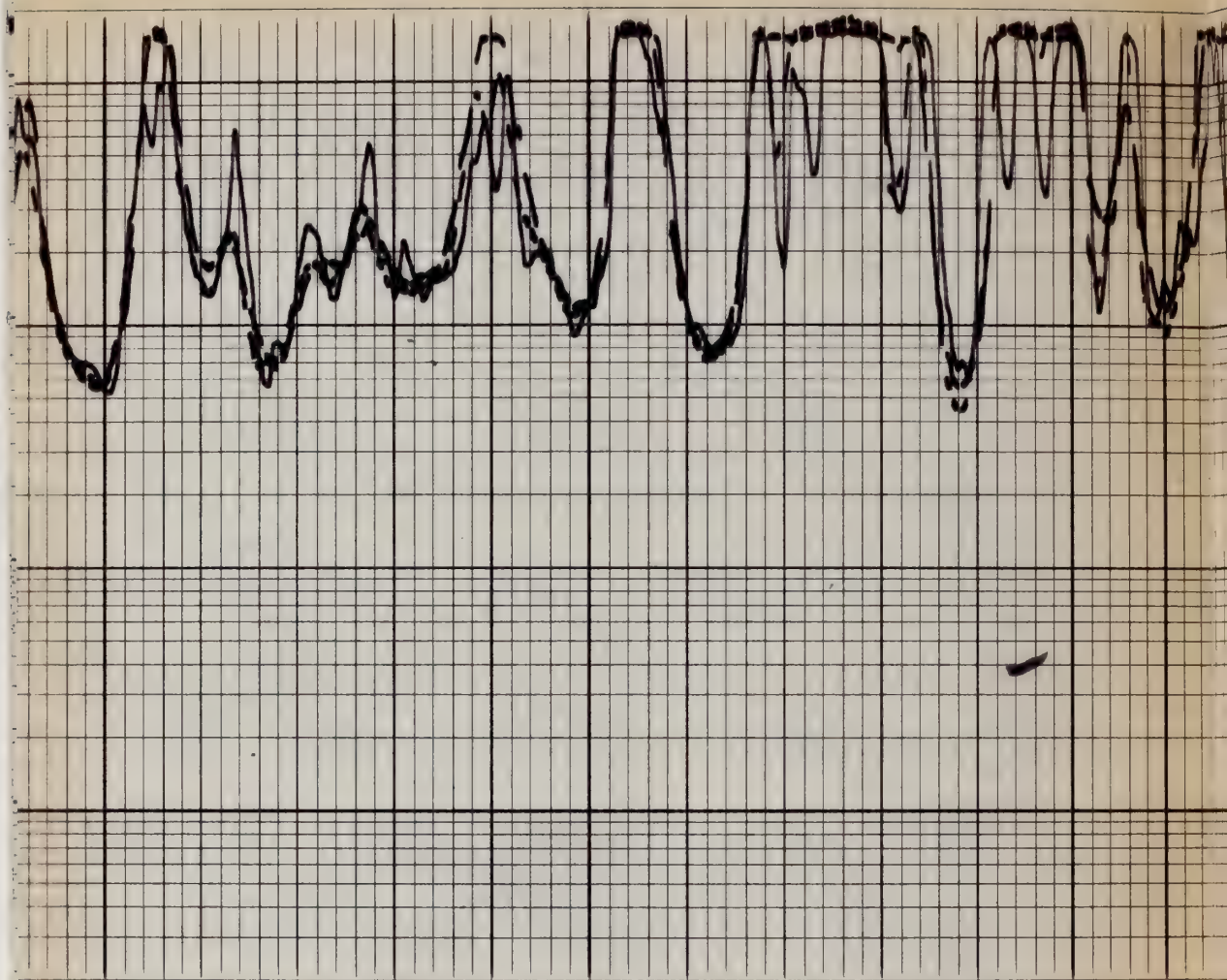
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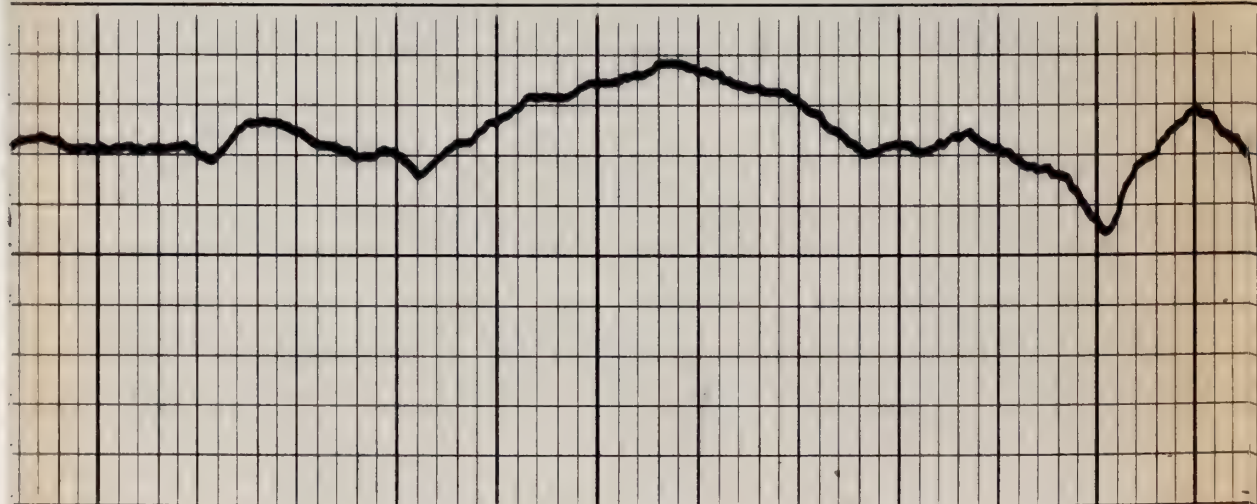


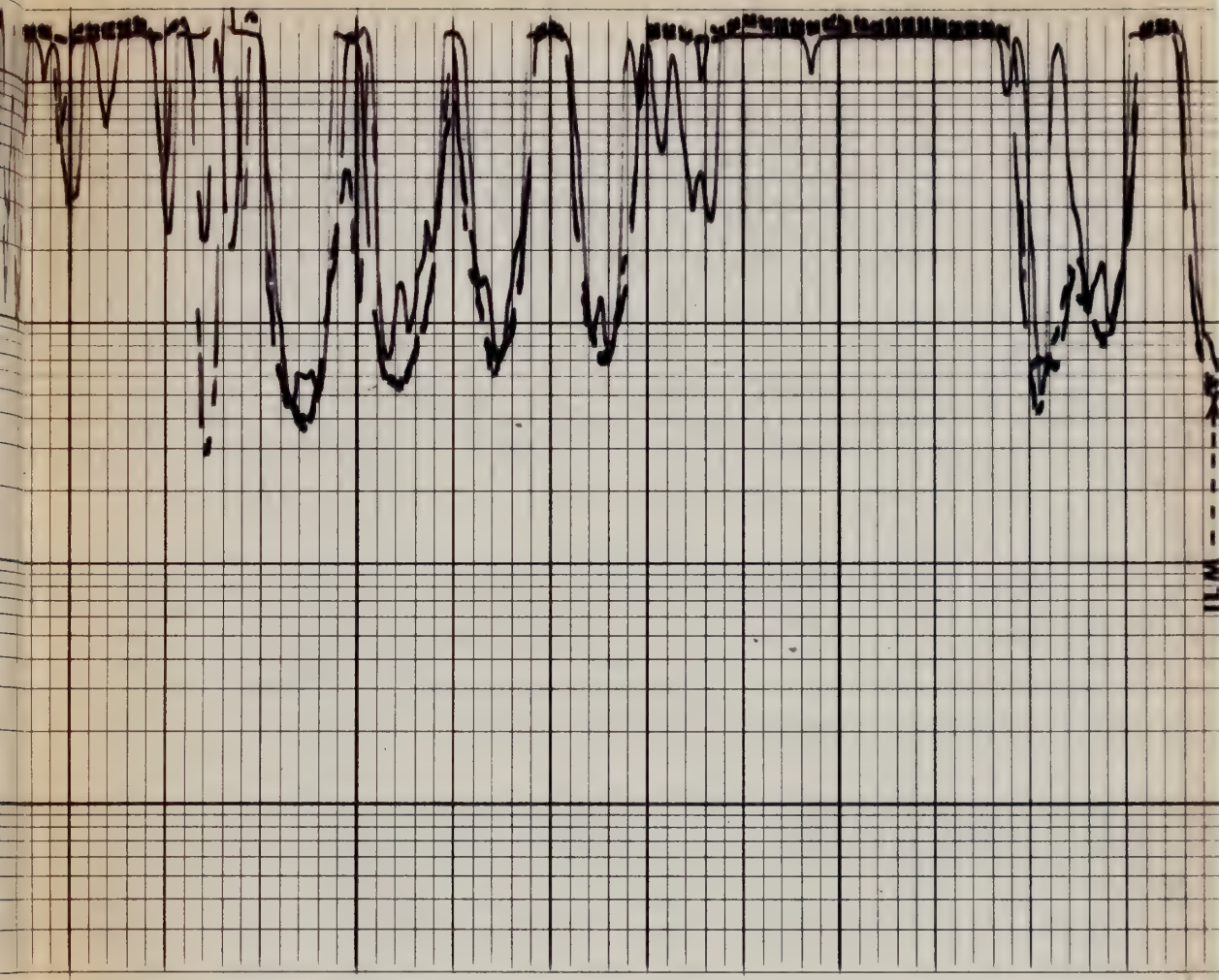
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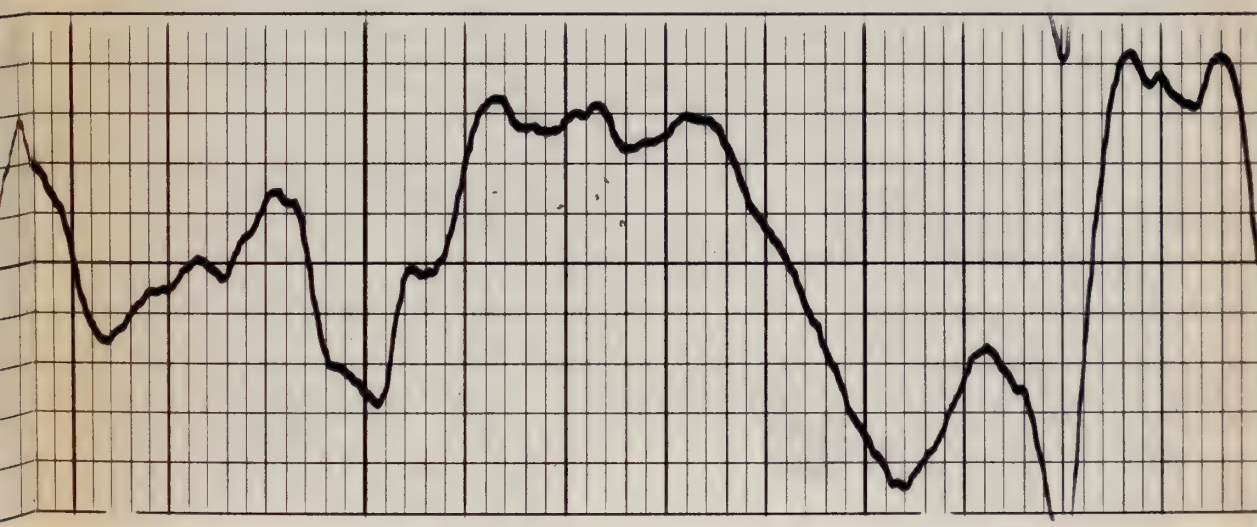


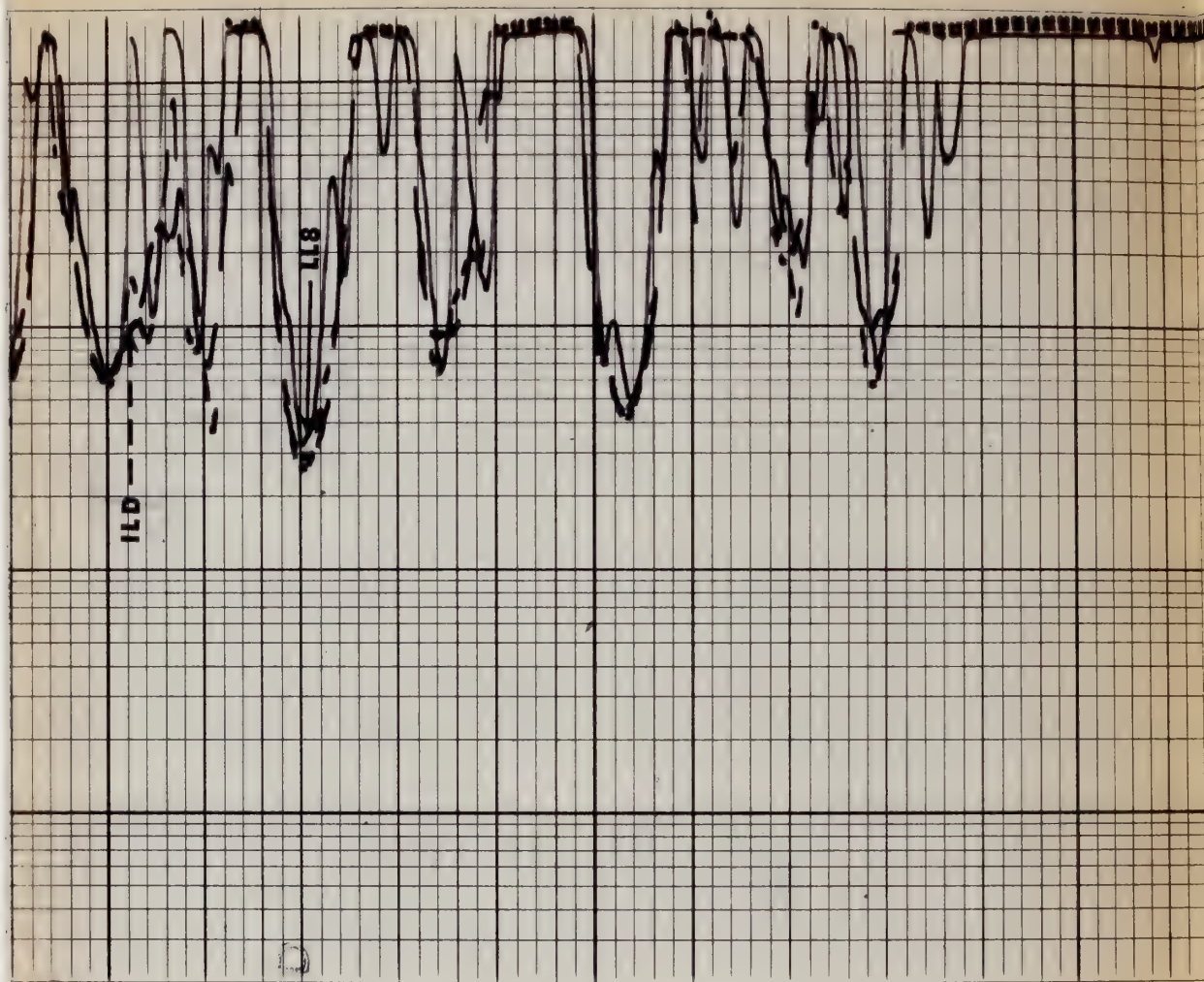
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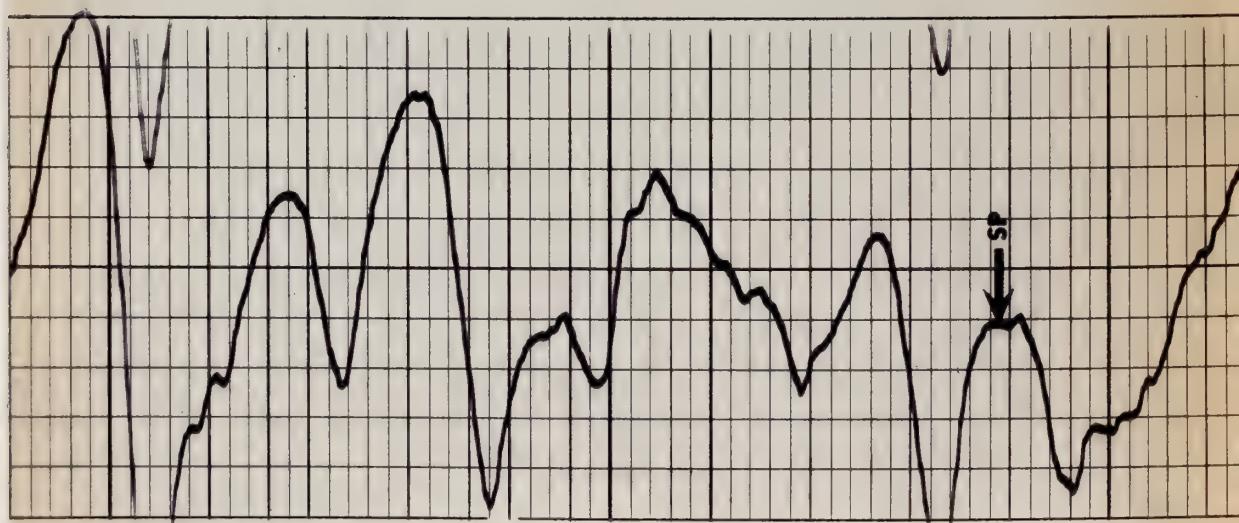
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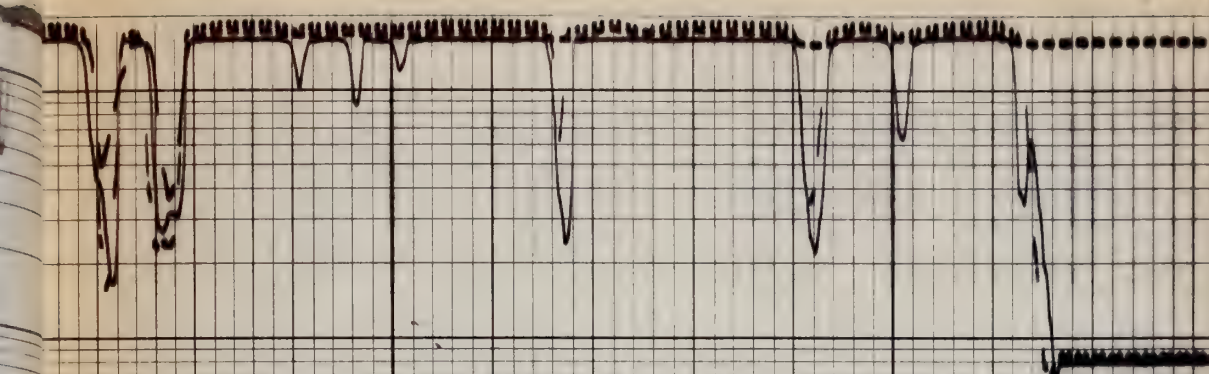




2000

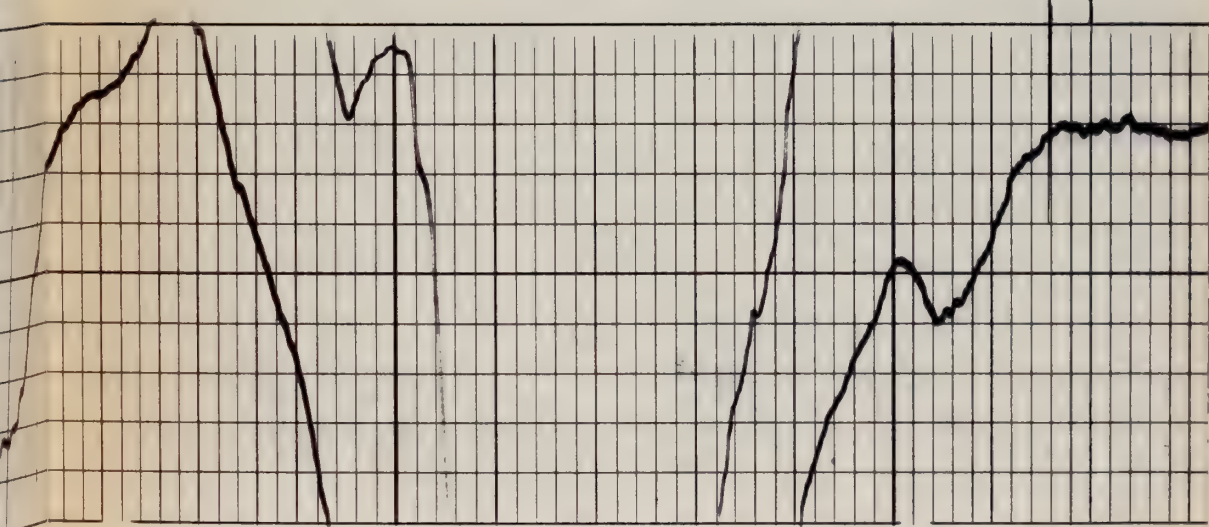
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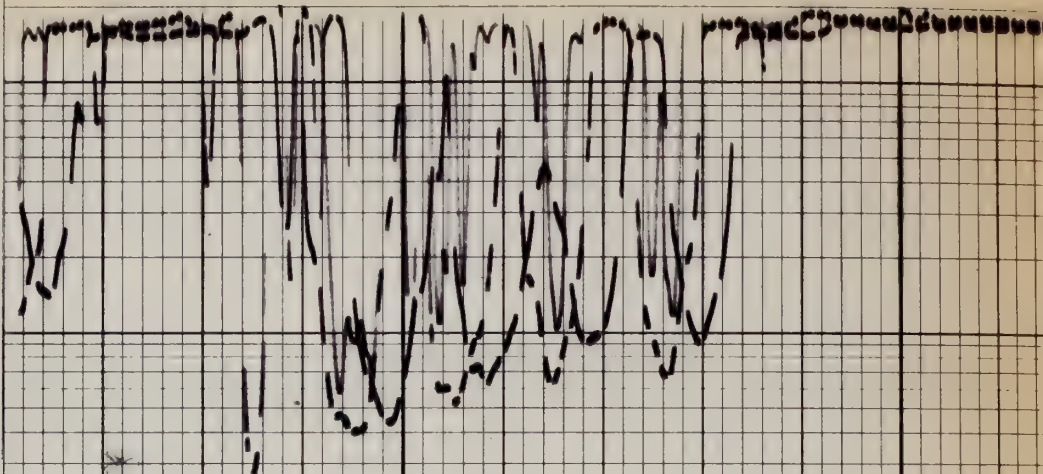




200

2200

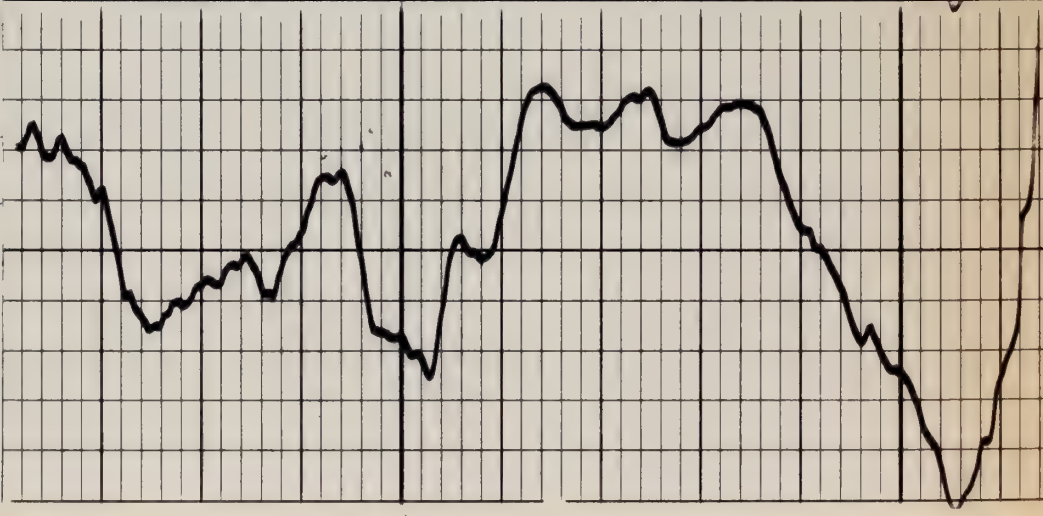


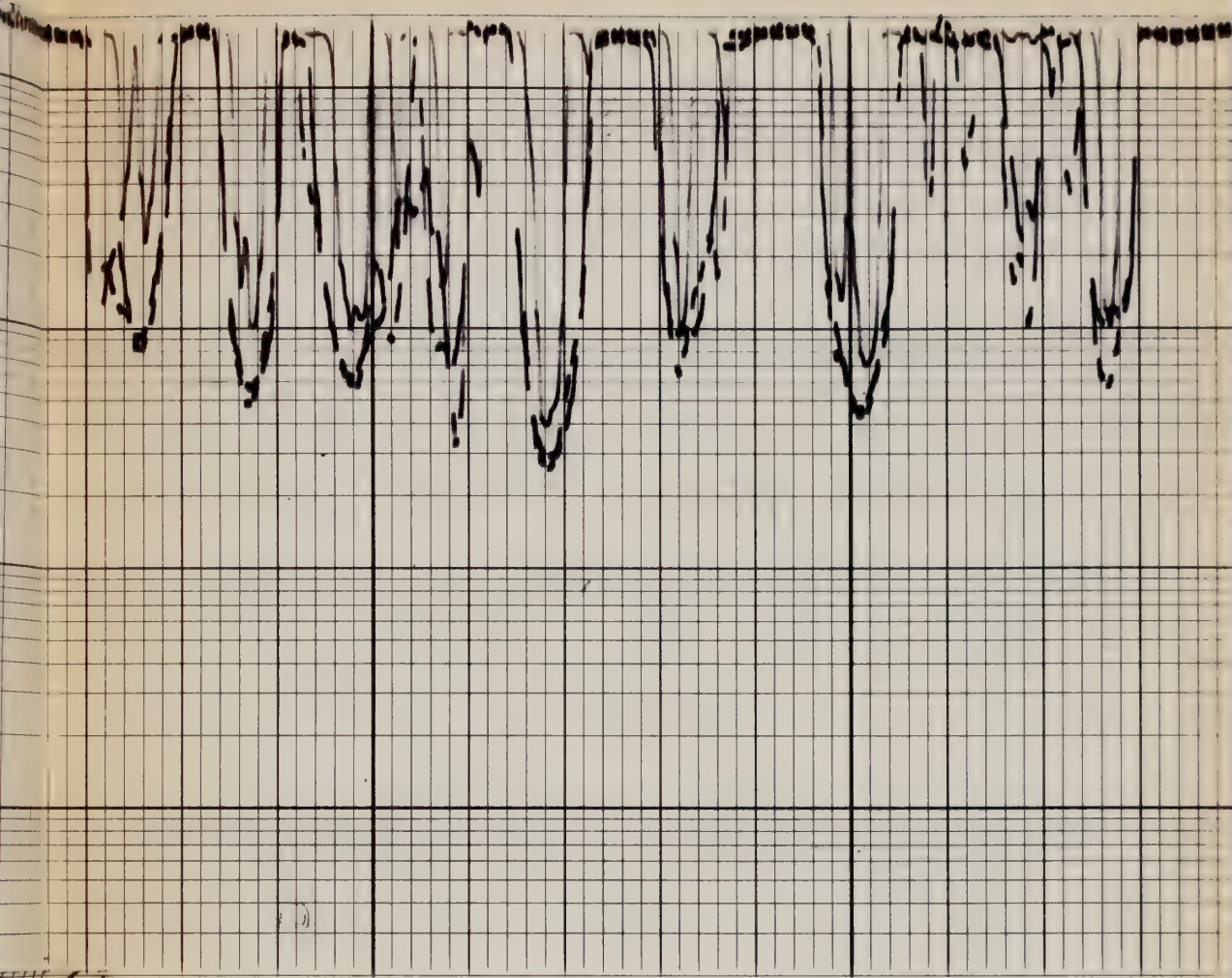


REPEAT SECTION

- CURVES INVALID

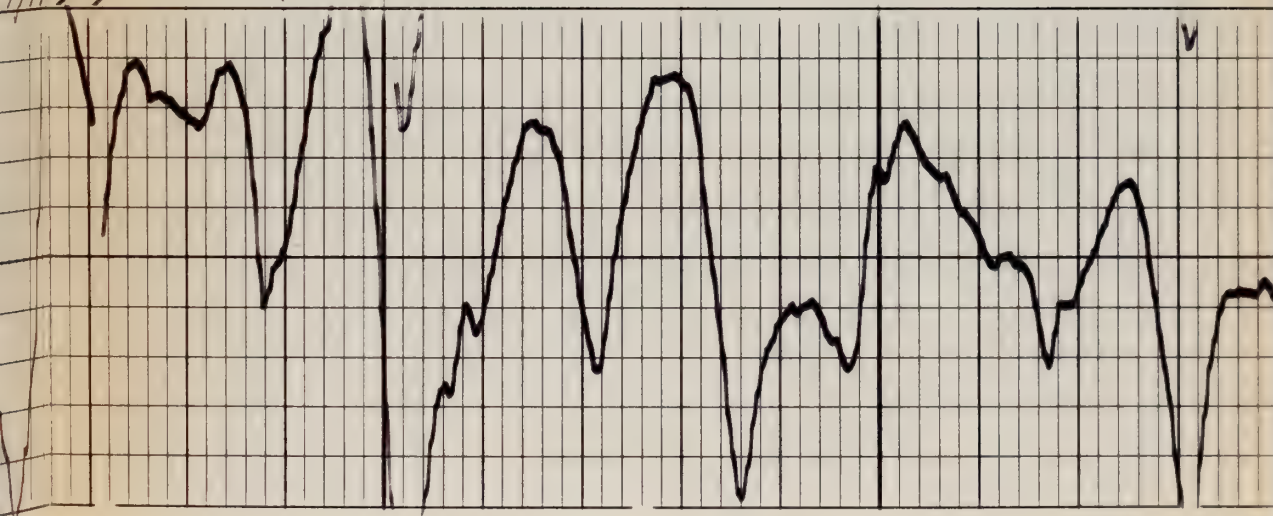
MEMORIZER

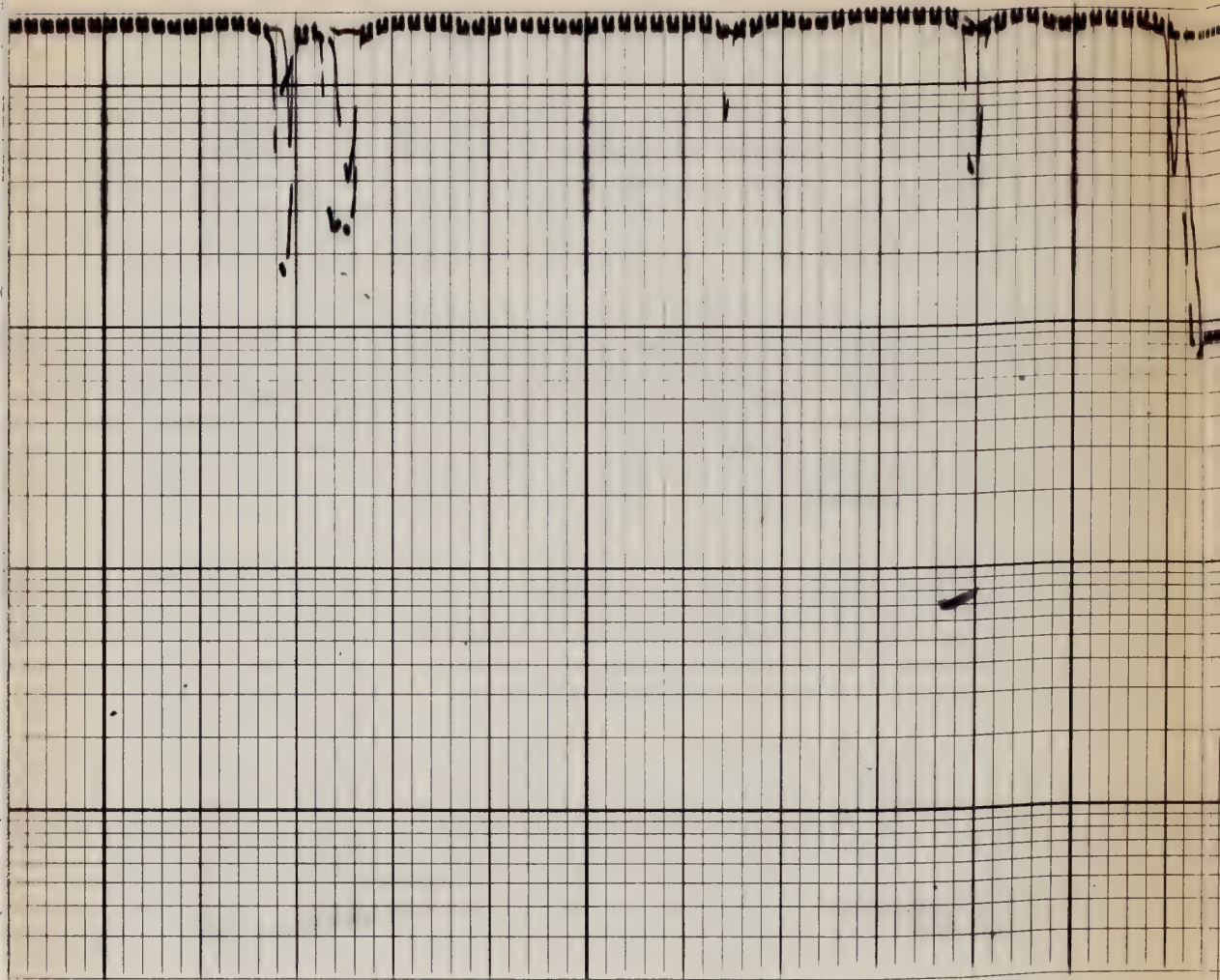




ORIZER OUT

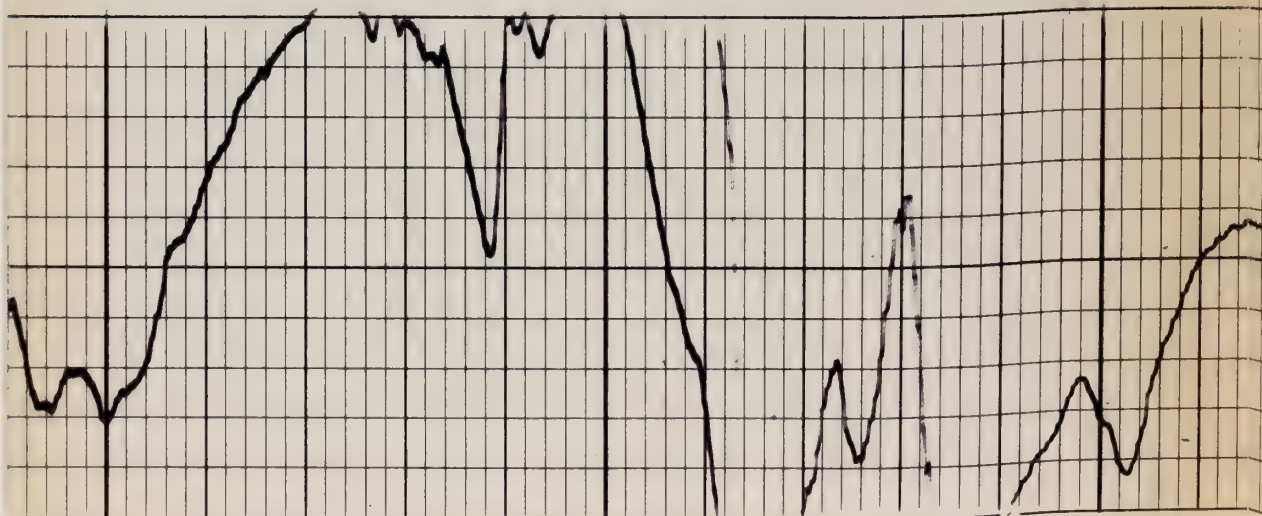
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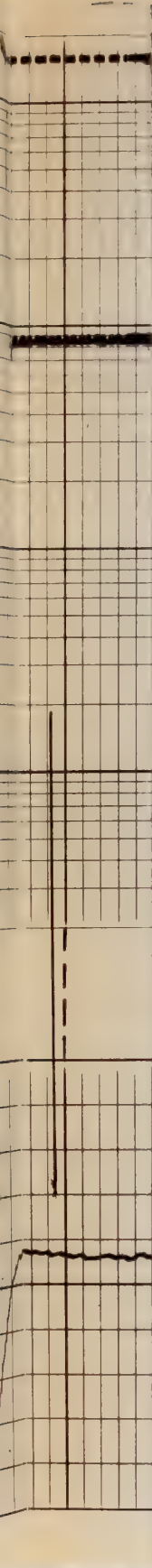




2100

2200





<div><div></div><div></div><div></div><div></div><div><div>15</div><div>—</div><div>+</div><div>MV</div></div></div>		<div>LATEROLOG — 8</div> <div>MEDIUM INDUCTION LOG</div> <div>DEEP INDUCTION LOG</div>		<div>RESISTIVITY</div> <div>OHMS. M²/M</div>	
DEPTHS					
SPONTANEOUS-POTENTIAL					
MILLIVOLTS					
COMPANY		THE ATLANTIC RICHFIELD COMPANY		SCHL. FR. 2216	
				SCHL. TO 2220	

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO

STATE COLORADO

DRIR TD 2220

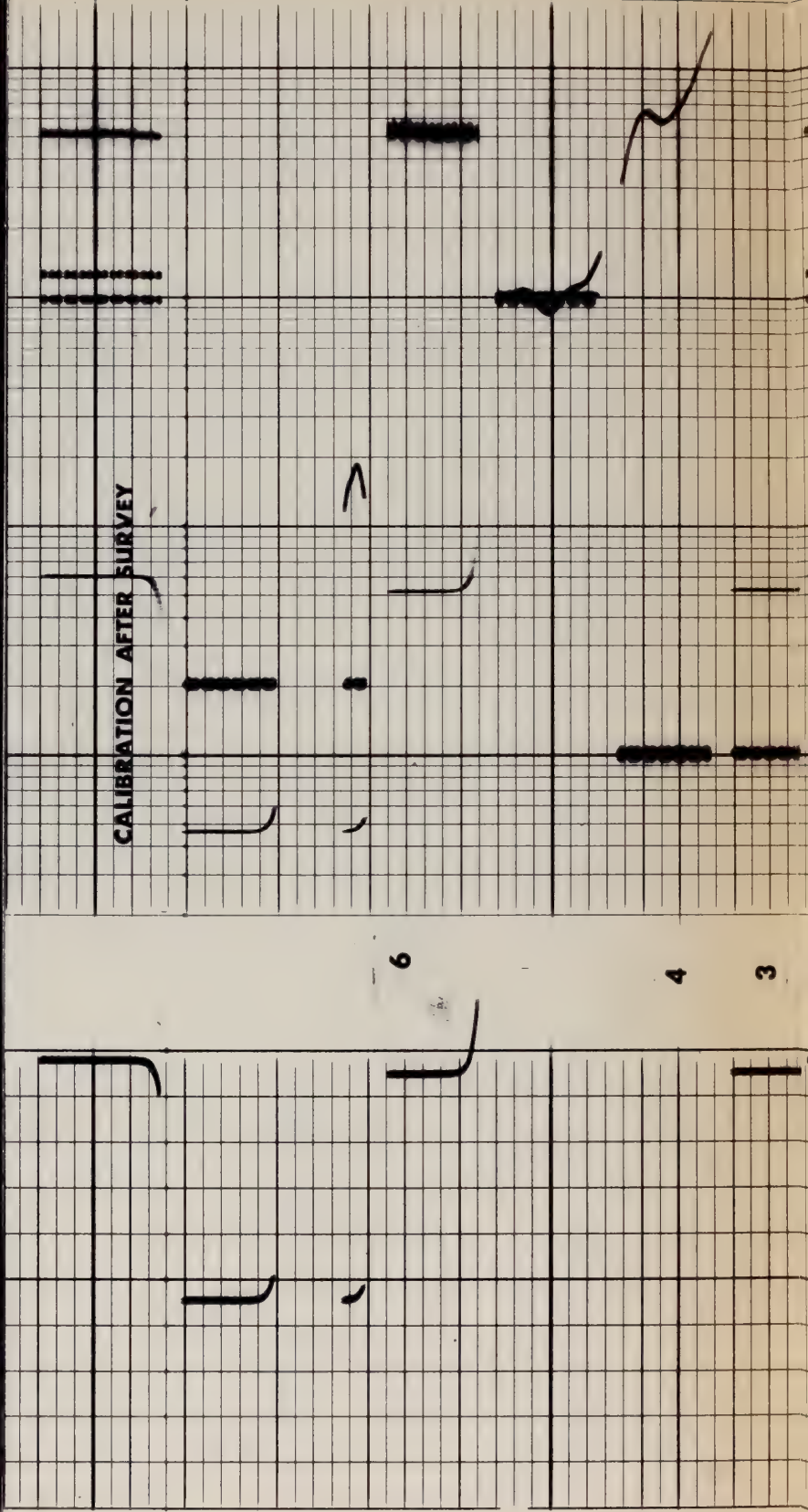
Elev:

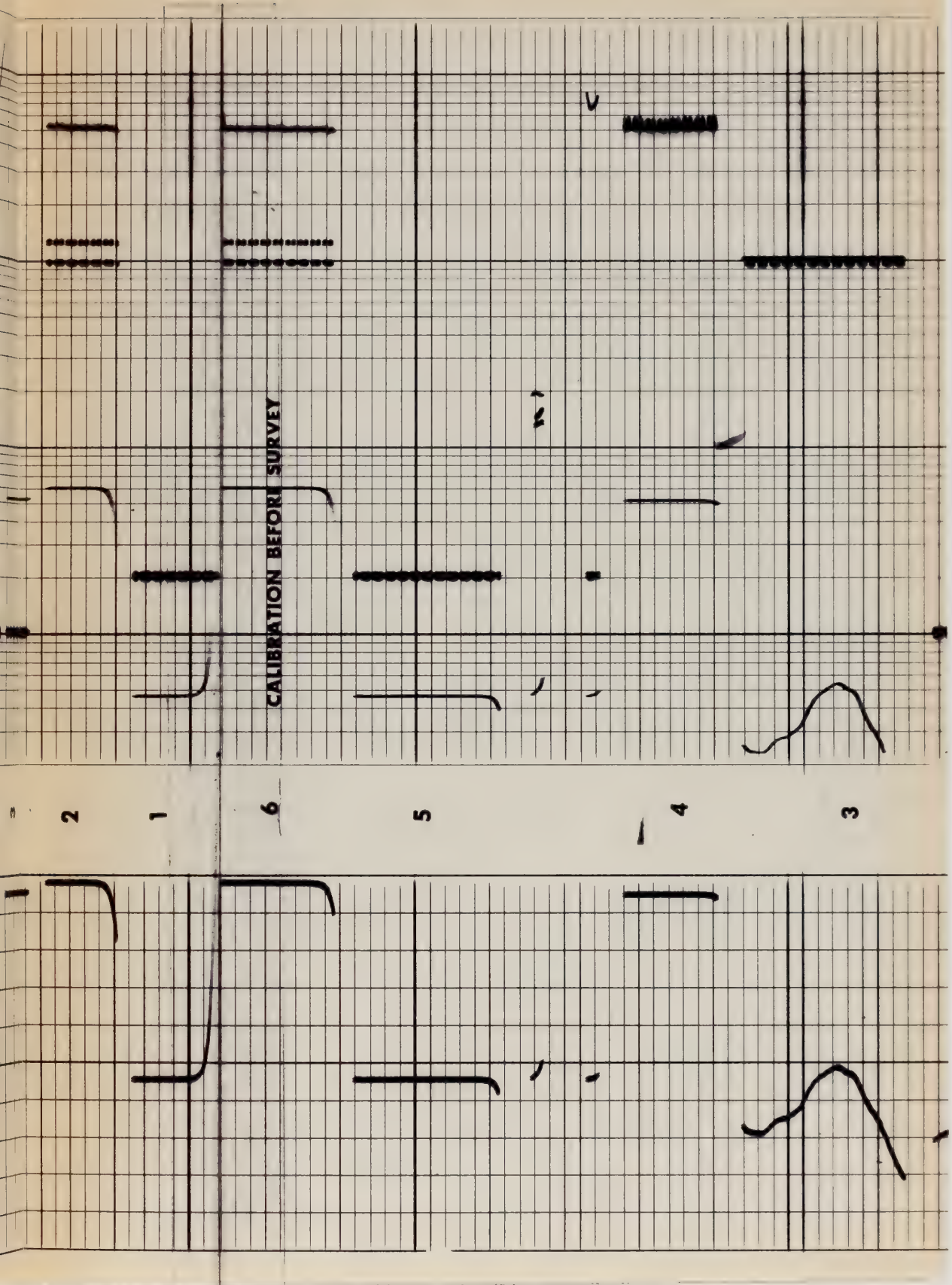
KB

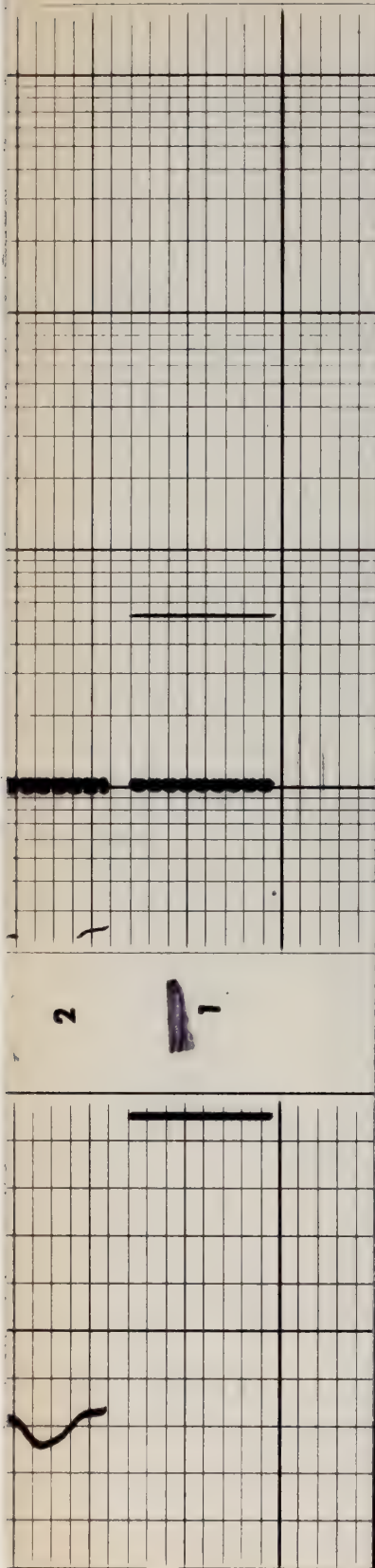
DF

GL 6888

CALIBRATION RECORD







CALIBRATION RECORD

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2216

SCHL. TD 2220

DRILR TD 2220

Elev: _____

KB _____

DF _____

GL 6888

SWS-1918-B

COUNTY RIO BLANCO, COLO.

FIELD or LOCATION _____

DATE _____

Run No. _____

Depth-Drill _____

Depth-Log _____

Btm. Log Int _____

Top Log Int _____

Casing-Drill _____

Casing-Log _____

Bit Size _____

Type Fluid in _____

Fluid Level _____

Dens. _____

pH _____

Source of Sa _____

R_{mt} @ Mea _____

R_{mf} @ Mea _____

R_{mc} @ Mea _____

Source: R_{mt} _____

R_m @ BHT _____

Time Since C _____

Max. Rec. Te _____

Equip _____

Recorded By _____

Witnessed By _____

SIMULTANEOUS

Schlumberger

COMPENSATED NEUTRON-
FORMATION DENSITY

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location: API Serial No.
2523' FSL & 2251' FWL

Sec. 7 Twp. 3S Rge. 96W

Other Services:

BHC-GR
HRT
DILPermanent Datum: GL ; Elev.: 6888
Log Measured From GL , 0 Ft. Above Perm. Datum
Drilling Measured From GLElev.: K.B. _____
D.F. _____
G.L. 6888

Date	8/23/74					
Run No.	ONE					
Depth—Driller	2220					
Depth—Logger	2220					
Btm. Log Interval	2219					
Top Log Interval	61					
Casing—Driller	8-5/8@	59	@	@	@	@
Casing—Logger	61					
Bit Size	6-1/4					
Type Fluid in Hole	WATER					
Fluid Level	440					
Dens.	Visc.					
pH	Fluid Los	ml	ml	ml	ml	ml
Source of Sample	PIT					
R _{mm} @ Meas. Temp.	5.04 @88	°F	@	°F	@	°F
R _{mf} @ Meas. Temp.	@	°F	@	°F	@	°F
R _{mc} @ Meas. Temp.	@	°F	@	°F	@	°F
Source: R _{mf}	R _{mc}					
R _m @ BHT	@	°F	@	°F	@	°F
Time Since Circ.	18 HOURS					
Max. Rec. Temp.	110	°F		°F		°F
Equip.	Location	5602	GJ			
Recorded By	BARGHOUTI					
Witnessed By	ELLIARD-TAIT					

The well name, location and level information data were furnished by the well owner.

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date	Sample No.				
Depth - Driller					
Type Fluid					
Source of Sample					
Rm @ Meas. Temp.	@	°F	@	°F	
Rmf @ Meas. Temp.	@	°F	@	°F	
Rmc @ Meas. Temp.	@	°F			
Rm @ BHT	@	°F			
Dens.	Visc.				
ph	Fluid Loss	ml			ml
% Water by Vol.					
% Oil by Vol.					
% Solids by Vol.					
Solids Av. Sp. Gr.					

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

LOGGING DATA

Matrix	Auto Hole Size Corr.	Hole Size Setting (if not auto)	Porosity Scale	From	To
LIMESTONE	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		60-0	TD	FL
	<input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No				

CNP

FDC

Liquid Density	Grain Density	Hole Fluid	Porosity Scale	From	To
1.00	2.71	LIQUID	60-0	TD	FL
.90	2.71	AIR	60-0	FL	CSG.

REMARKS

Service Order No. - 15133

BIT SIZE CASING DATA

Bit	From	To	Csg. Size	Csg. Wt.	From	To
5-1/4 CSG	TD	8-5/8			SURF	59

CALIBRATION DATA

Run No.	Gamma Ray		CNL—Before Log—ACPS		CNL—After Log—ACPS	
	API Scale	Background CPS	Total CPS	Long Spacing	Short Spacing	Long Spacing
1	0-150	140	610	119	273	119
2						
3						
4						
FDC — Before Log — ACPS						
1				P ₁	P ₂	
2				520	720	520
3						
4						

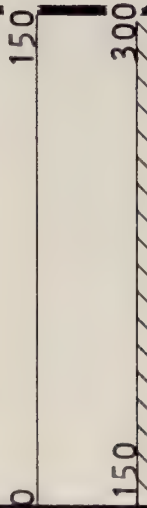
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

DETAIL LOG

" = 100'

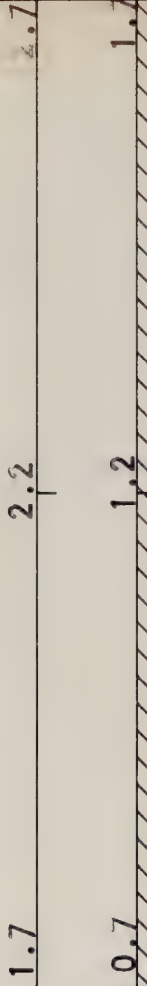
CALIPER HOLE DIAM. IN INCHES 	DEPTHS	CNL RATIO
CORRECTION GRAMS / CC.		

GAMMA RAY
API UNITS



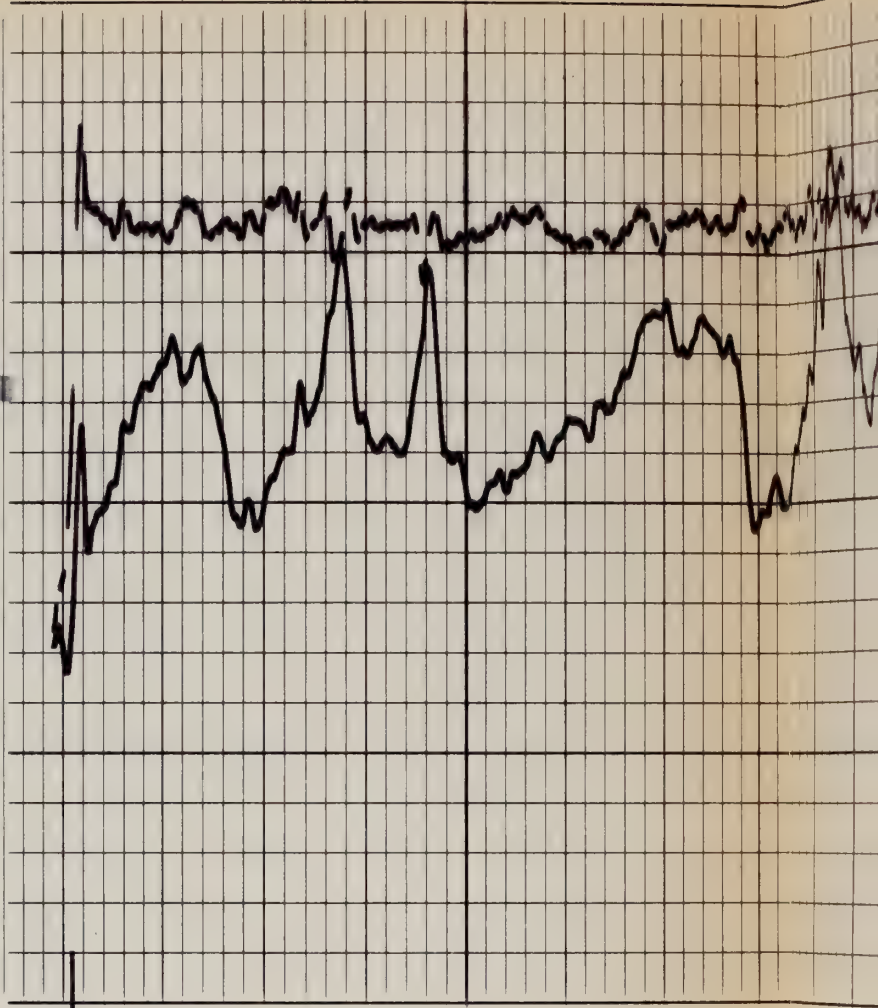
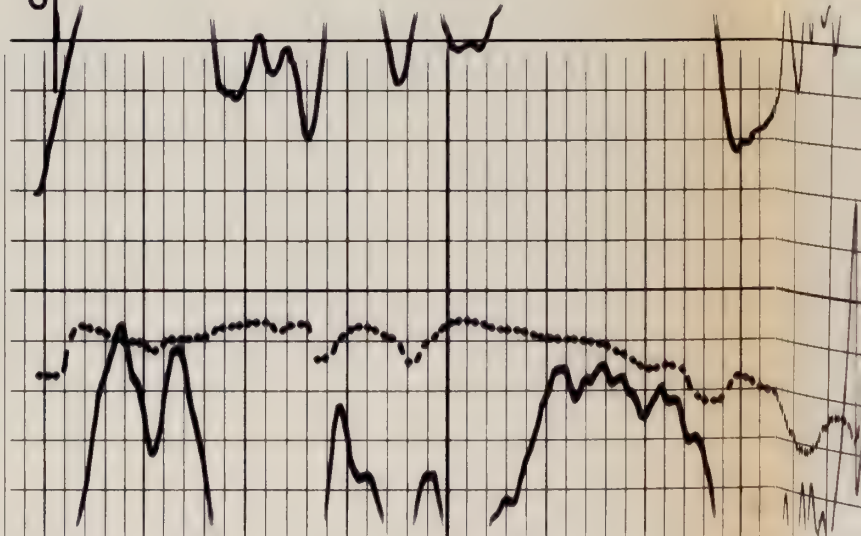
BULK DENSITY
GRAMS/CC.

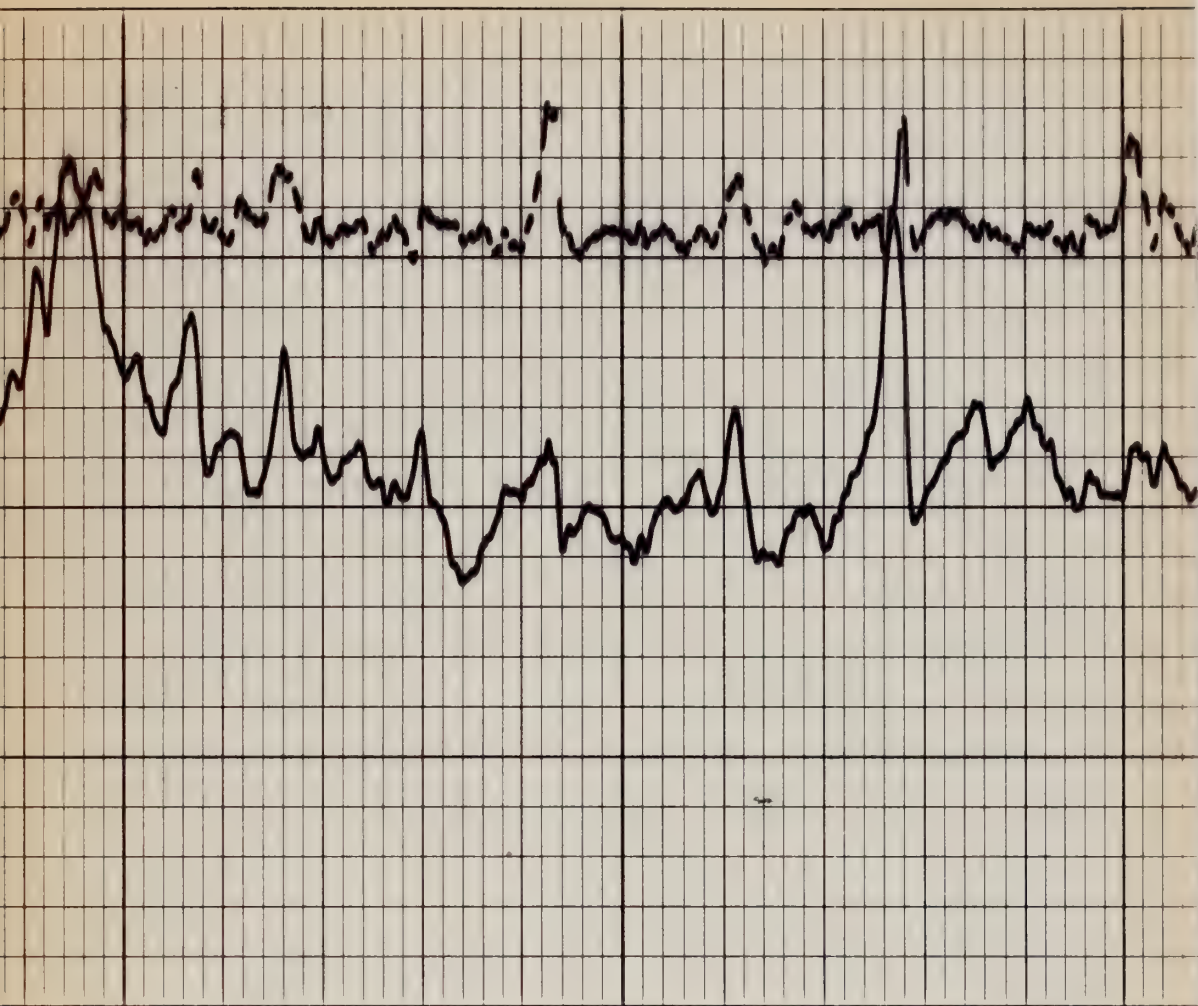
$P_{MA} = 2.71$



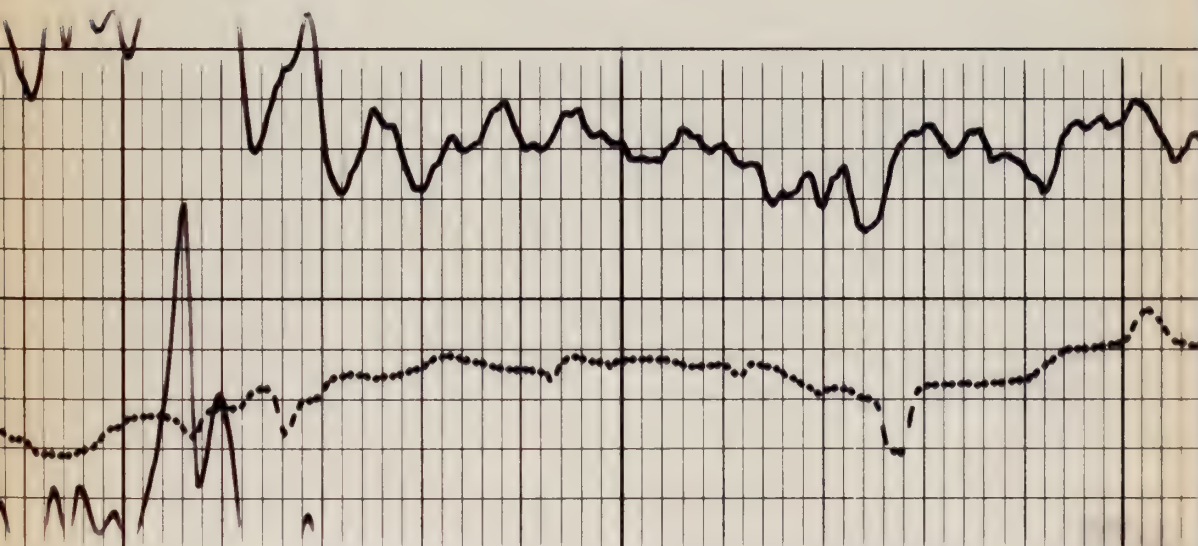
Casing

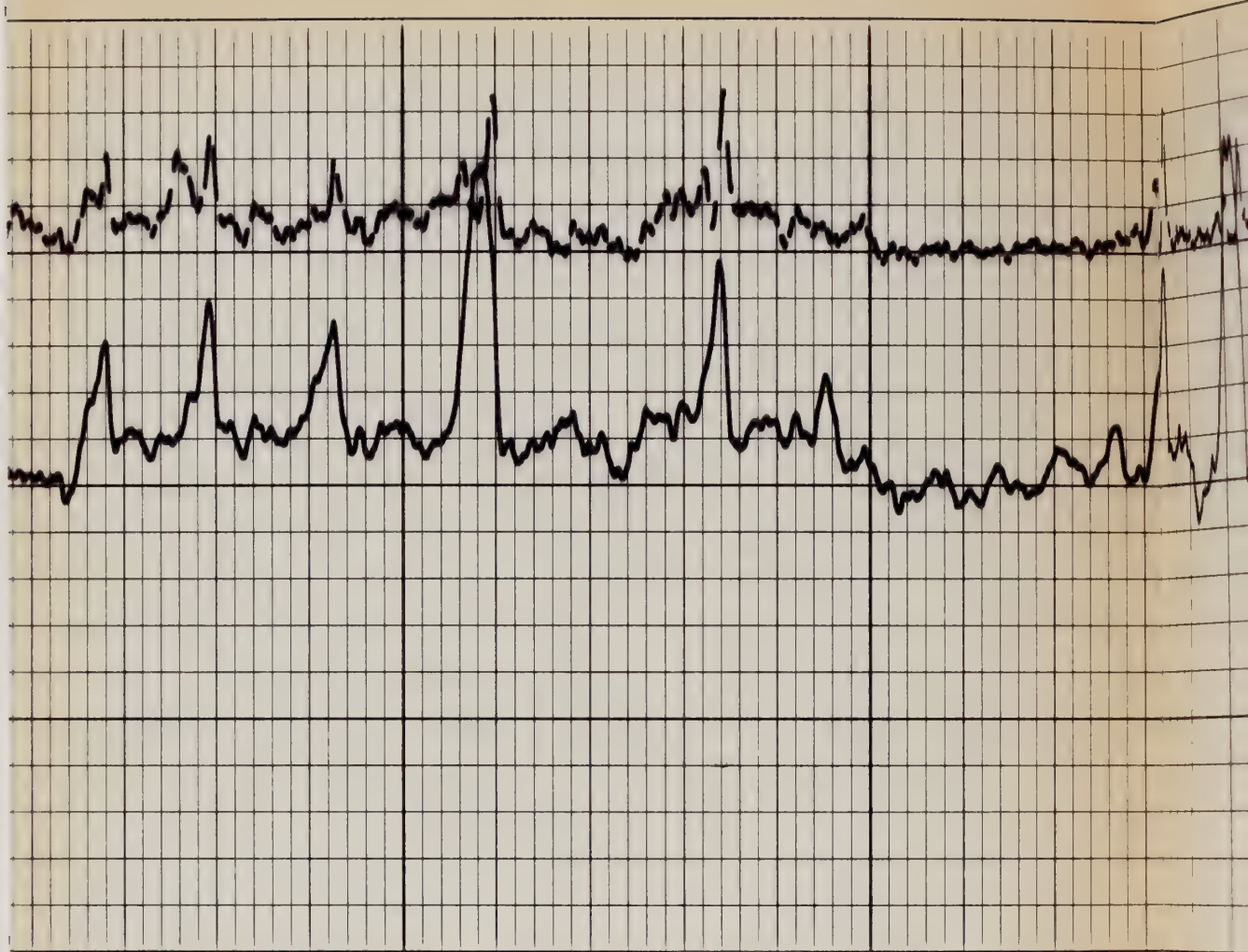
0100





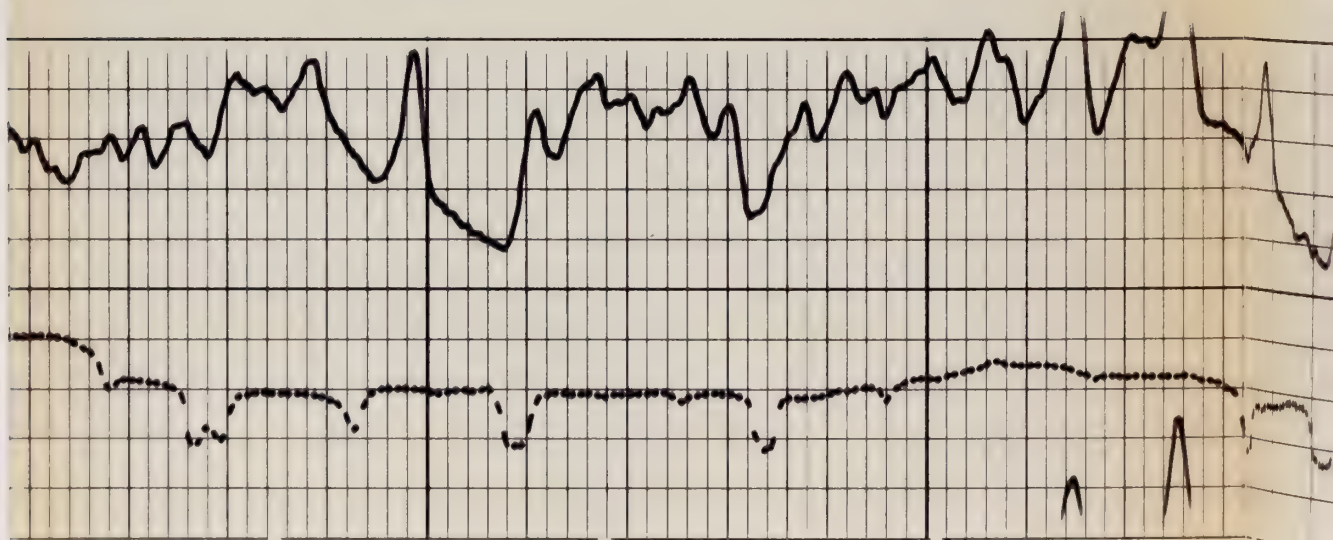
0200

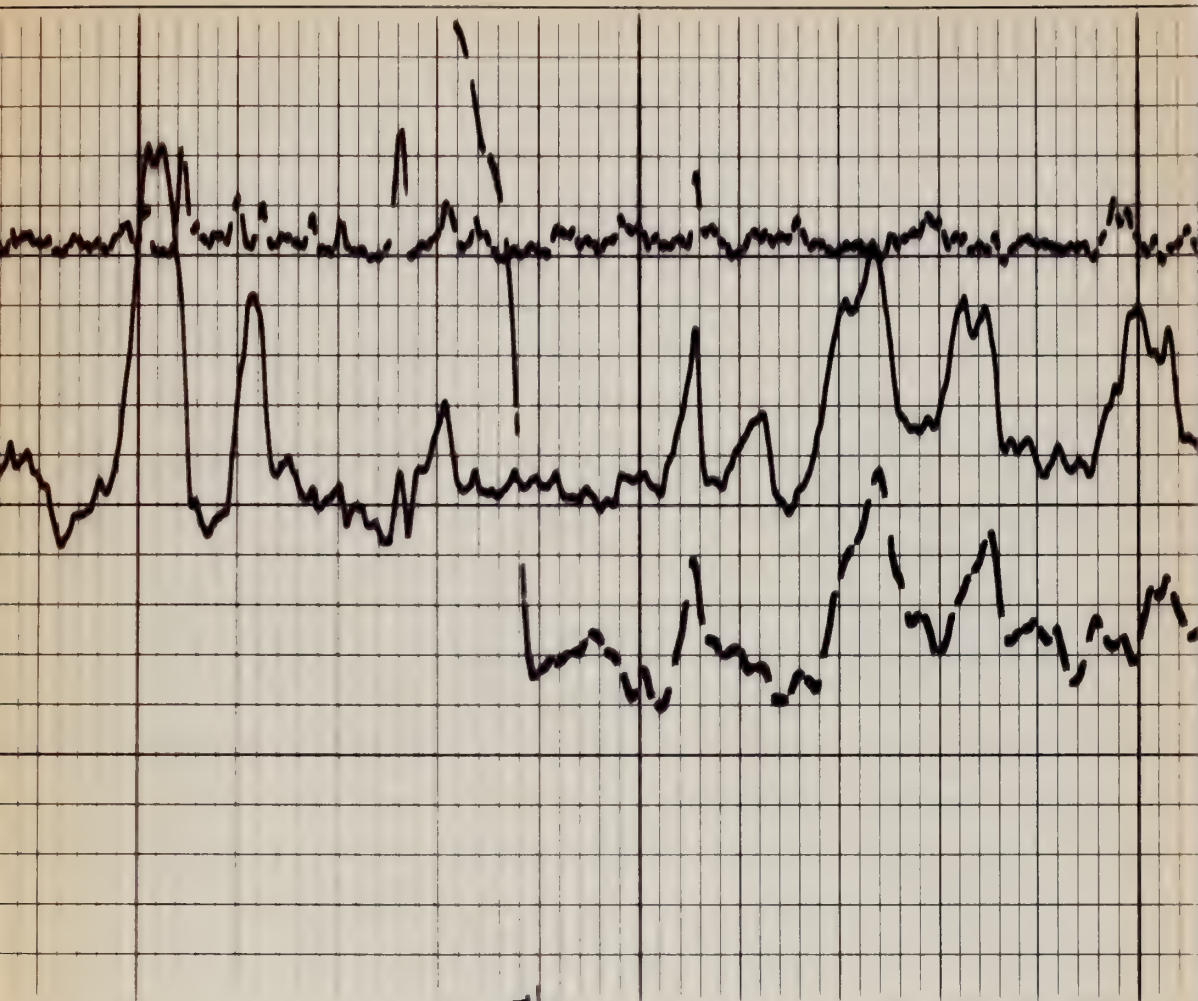




0300

0400

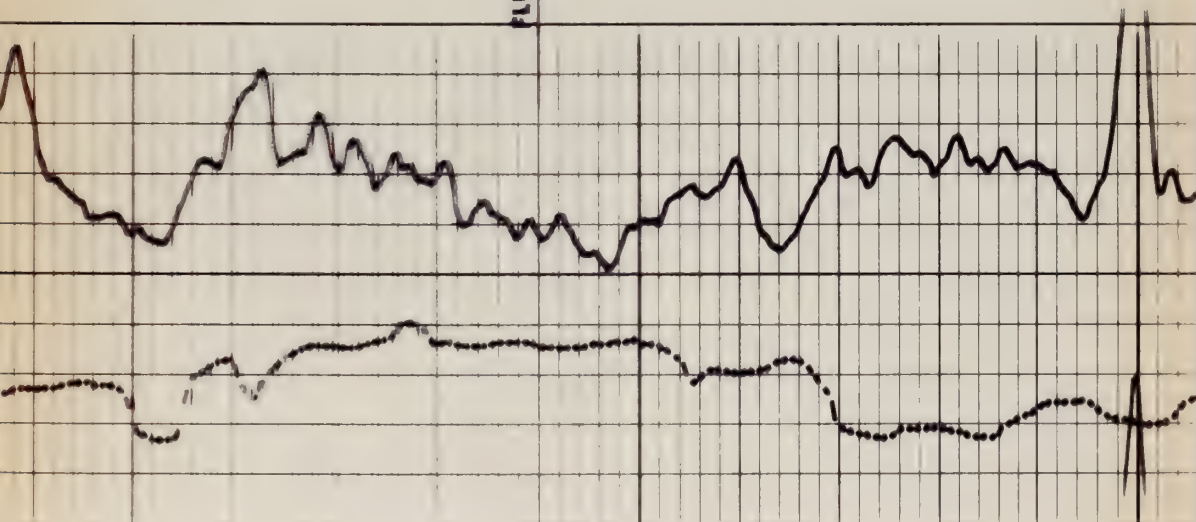


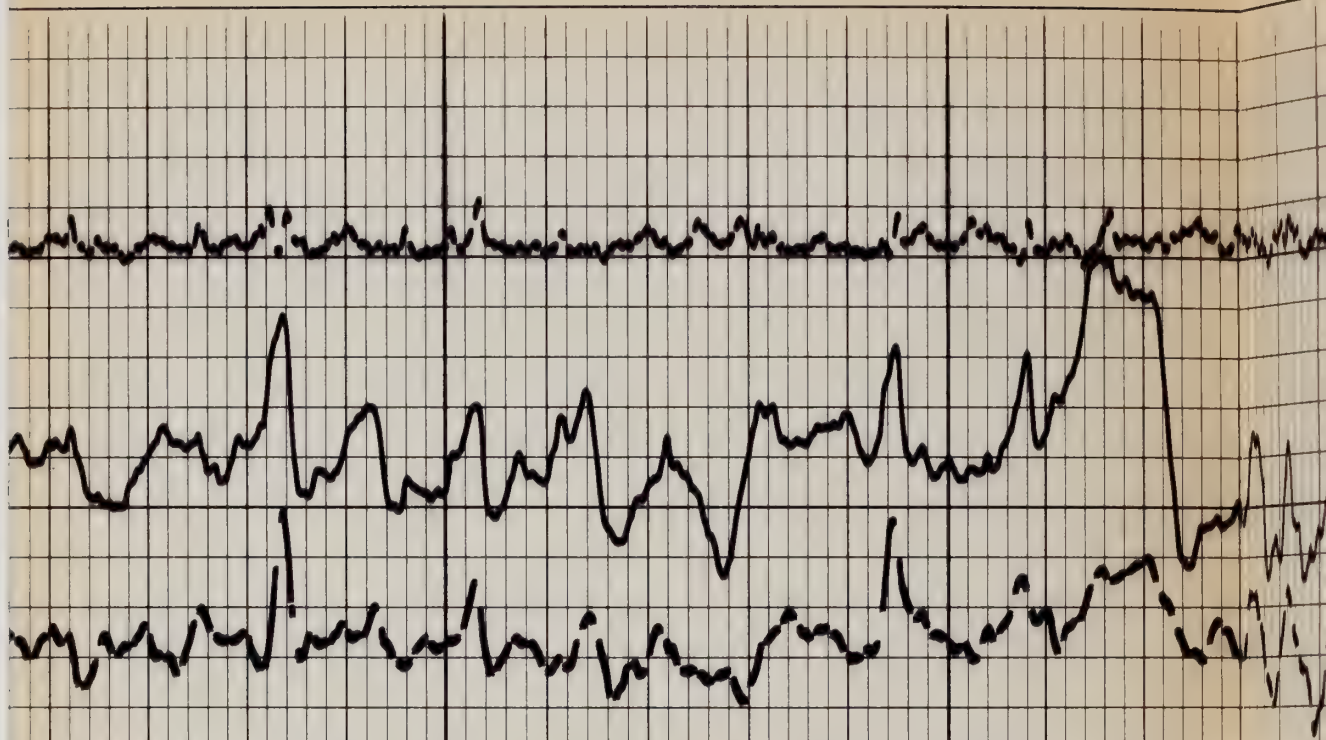


0400

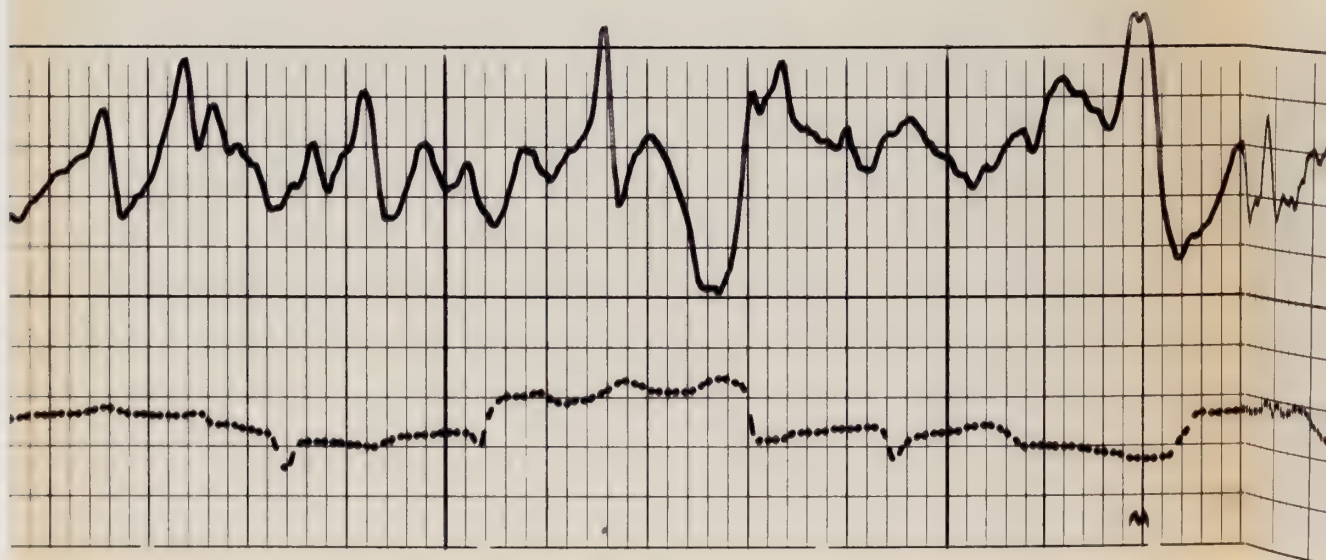
FLUID LEVEL

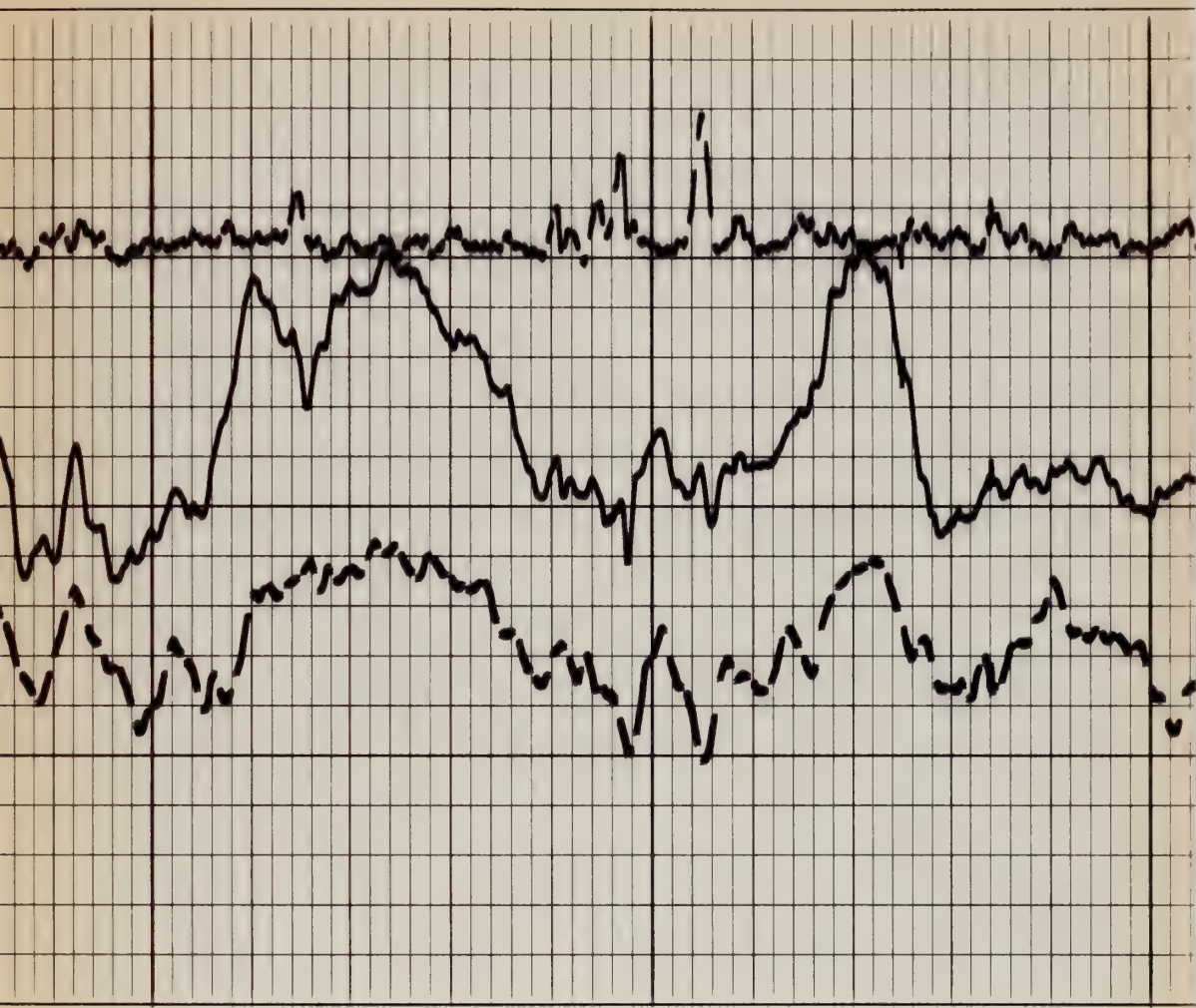
0500



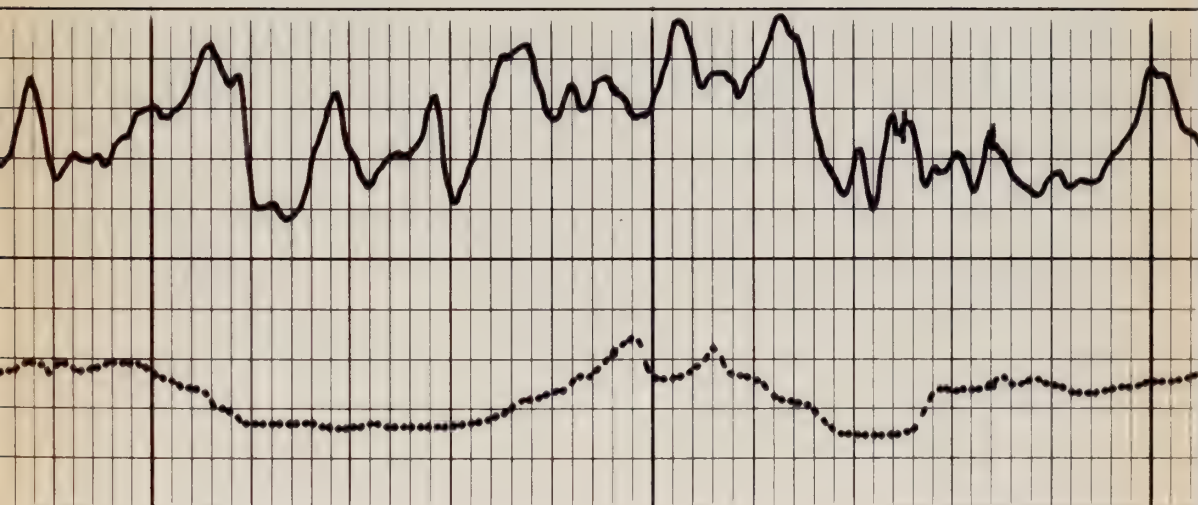


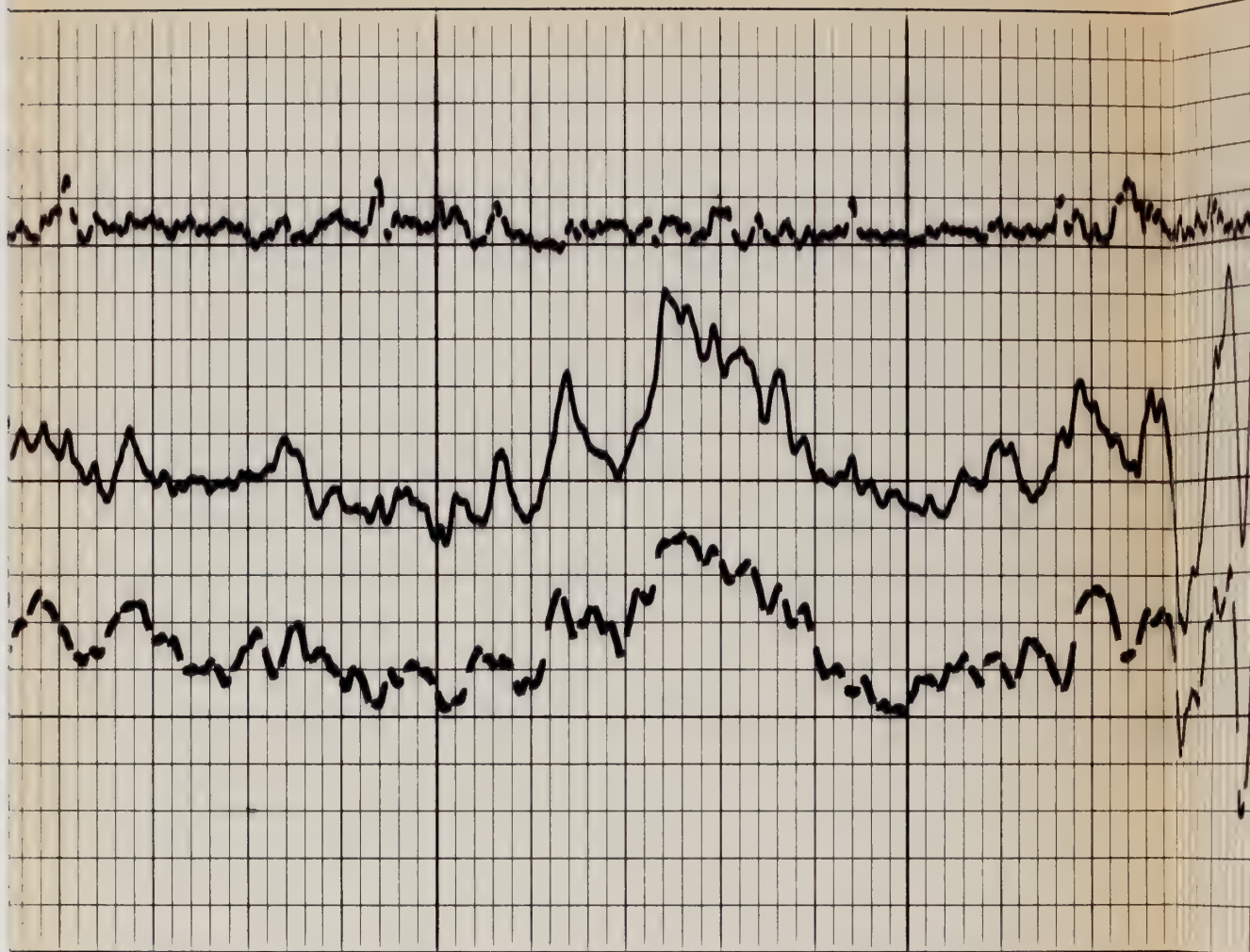
0600





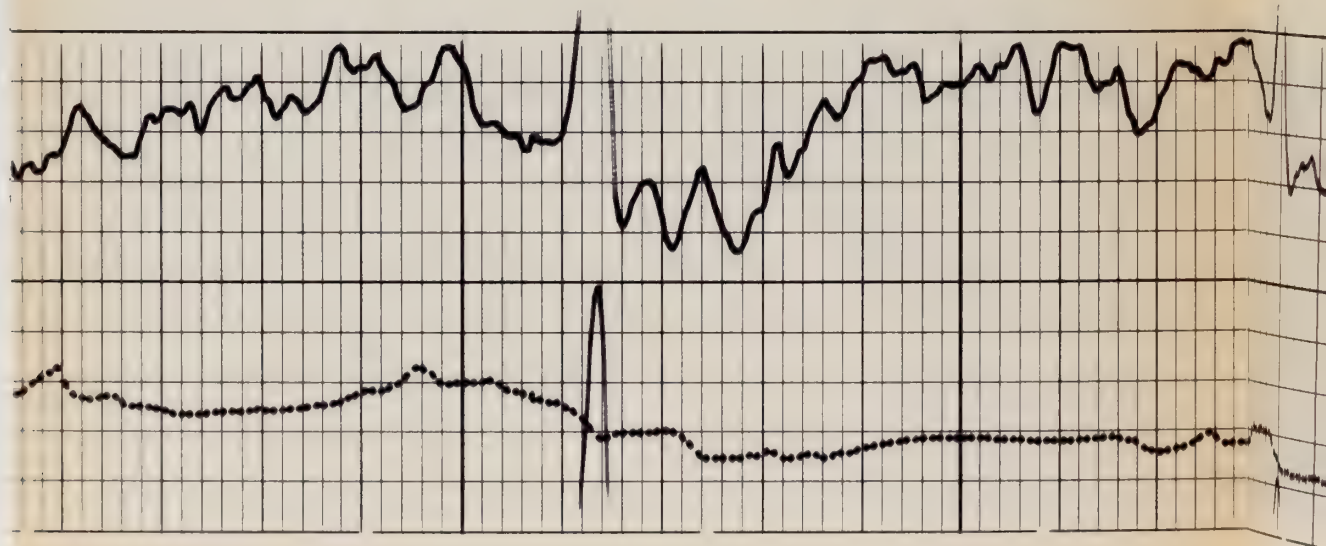
0700

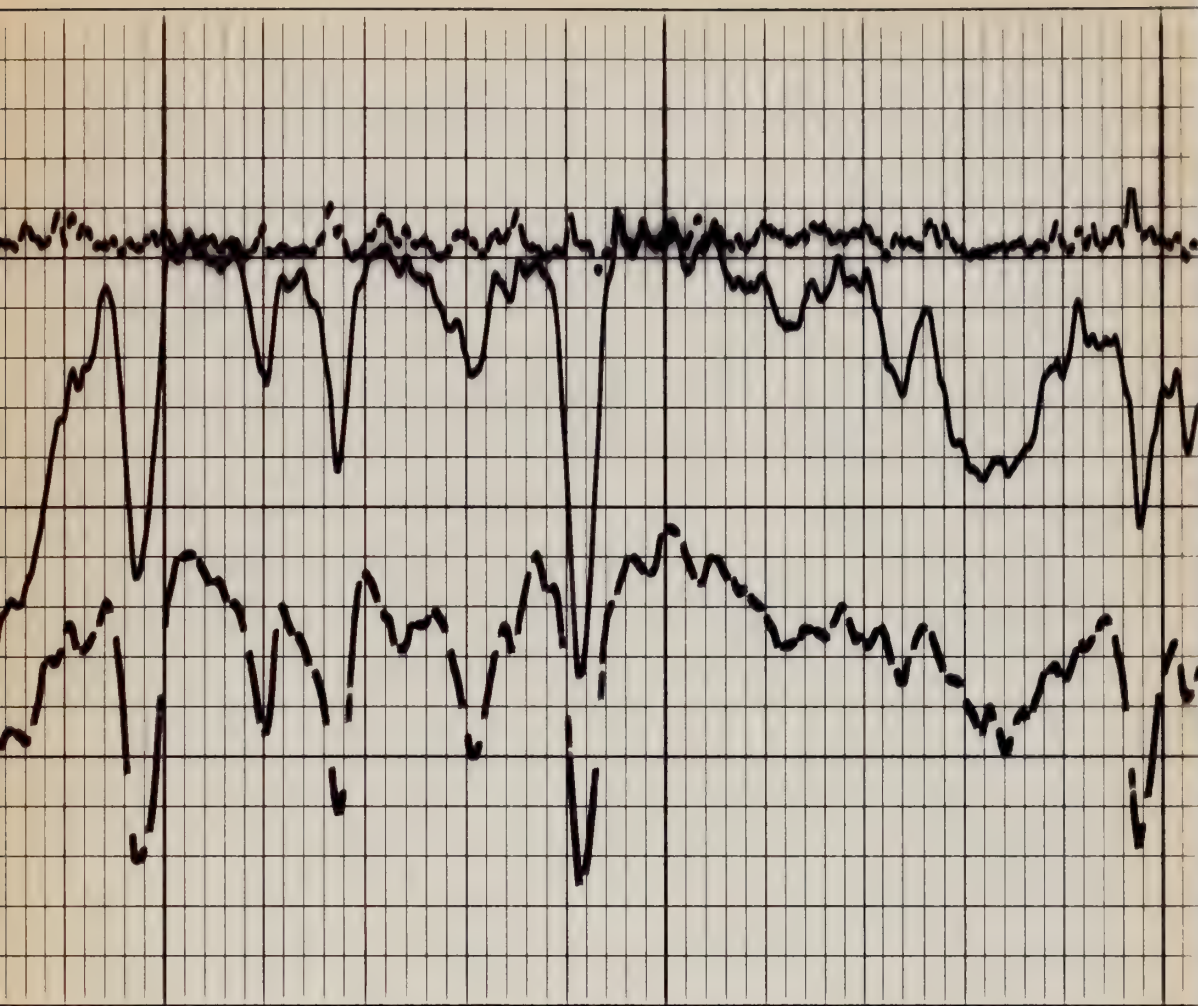




0800

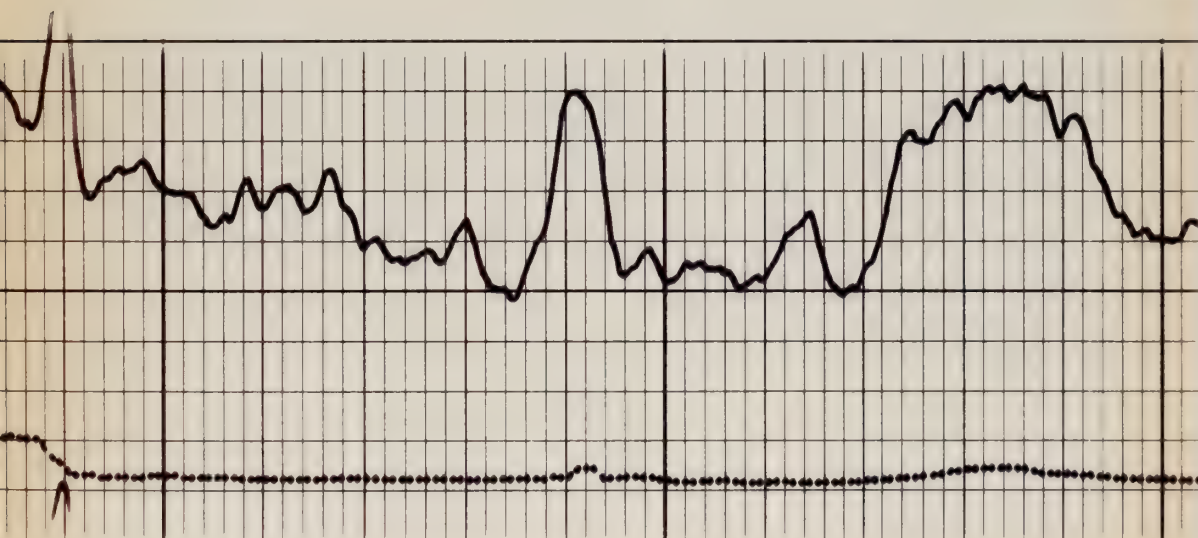
09

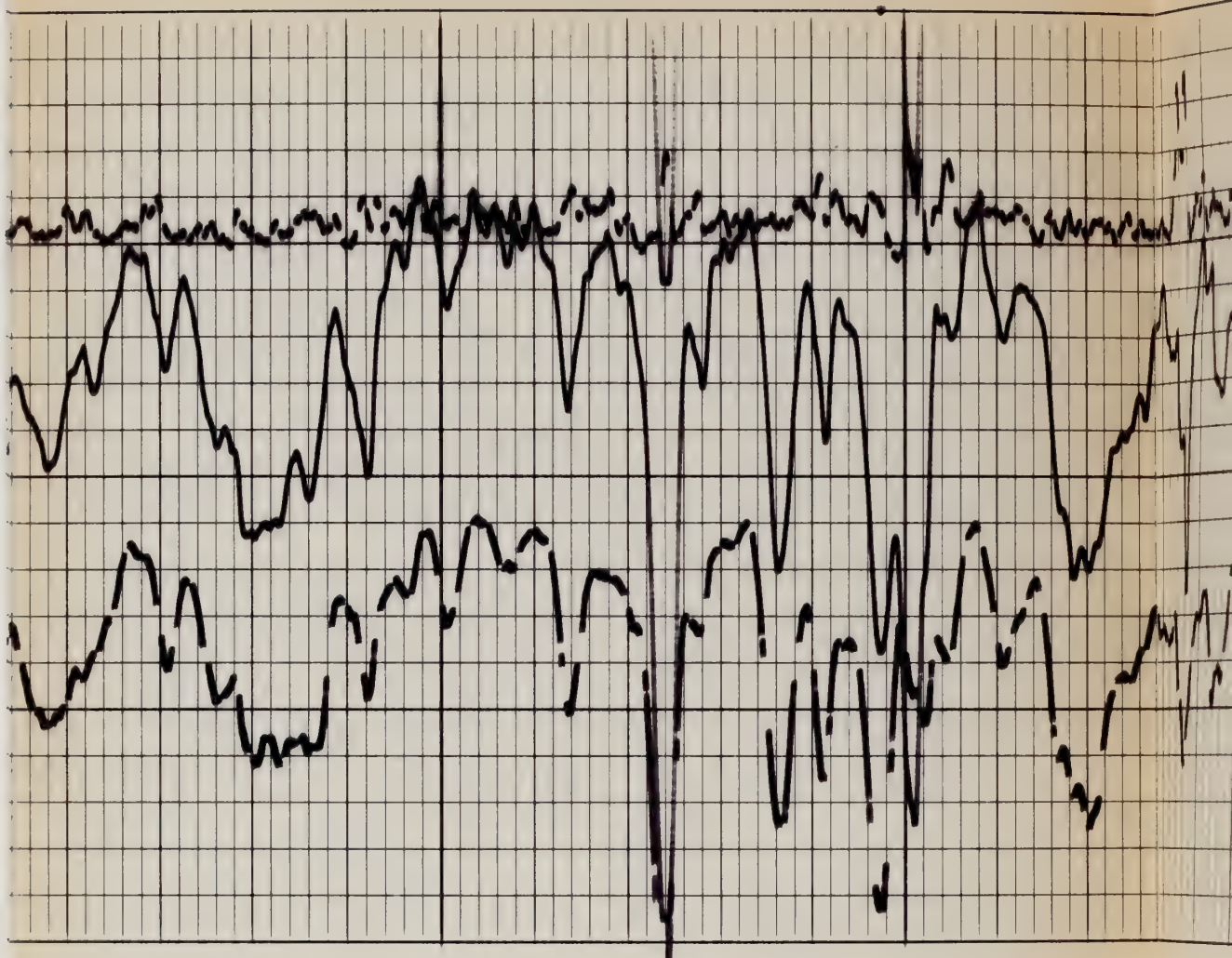




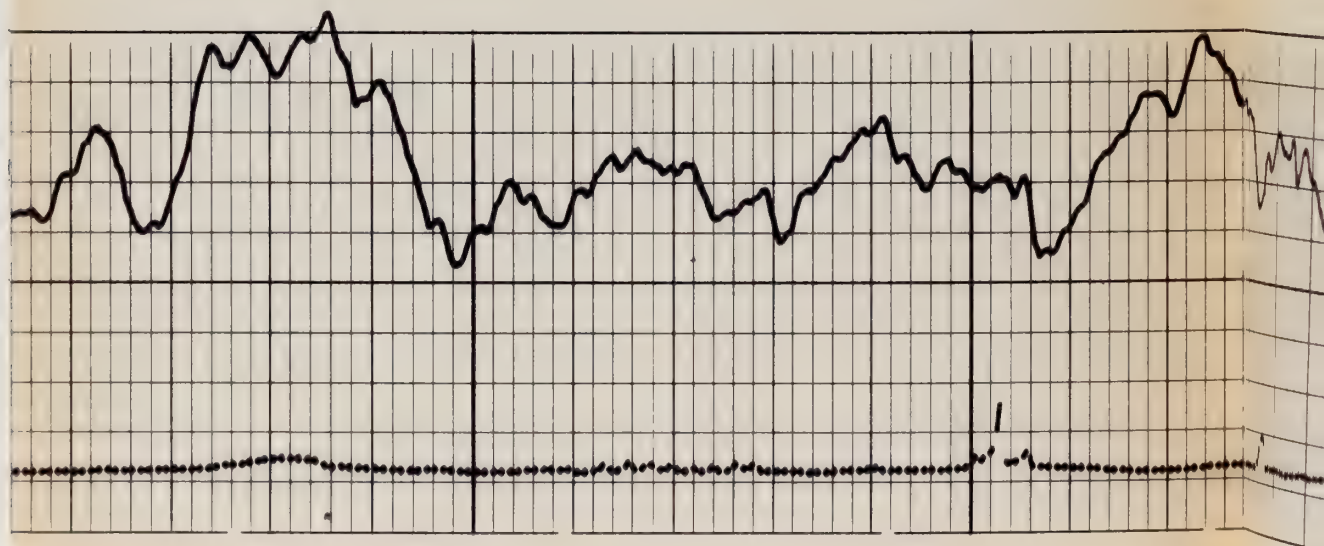
0900

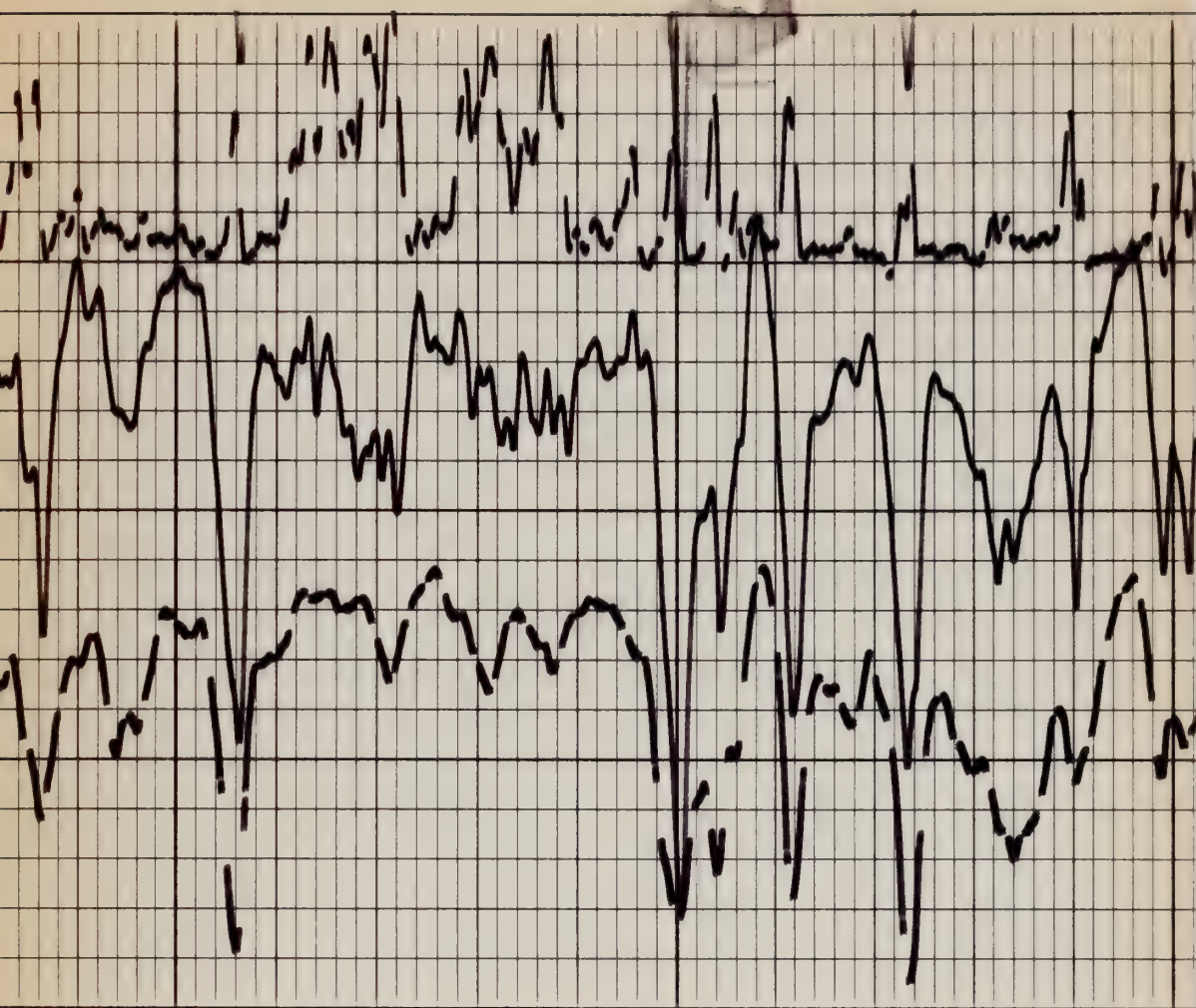
1000



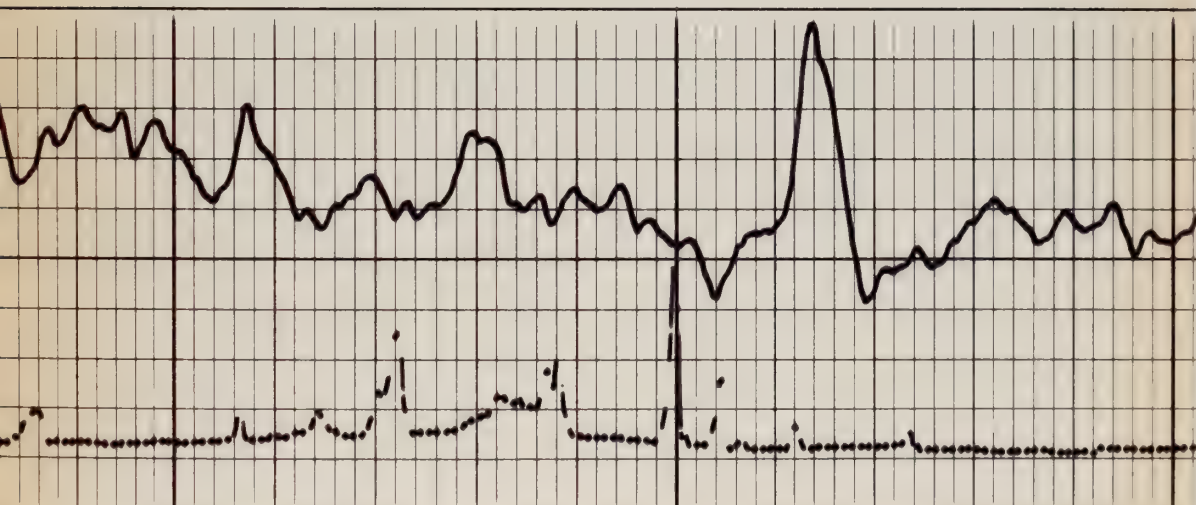


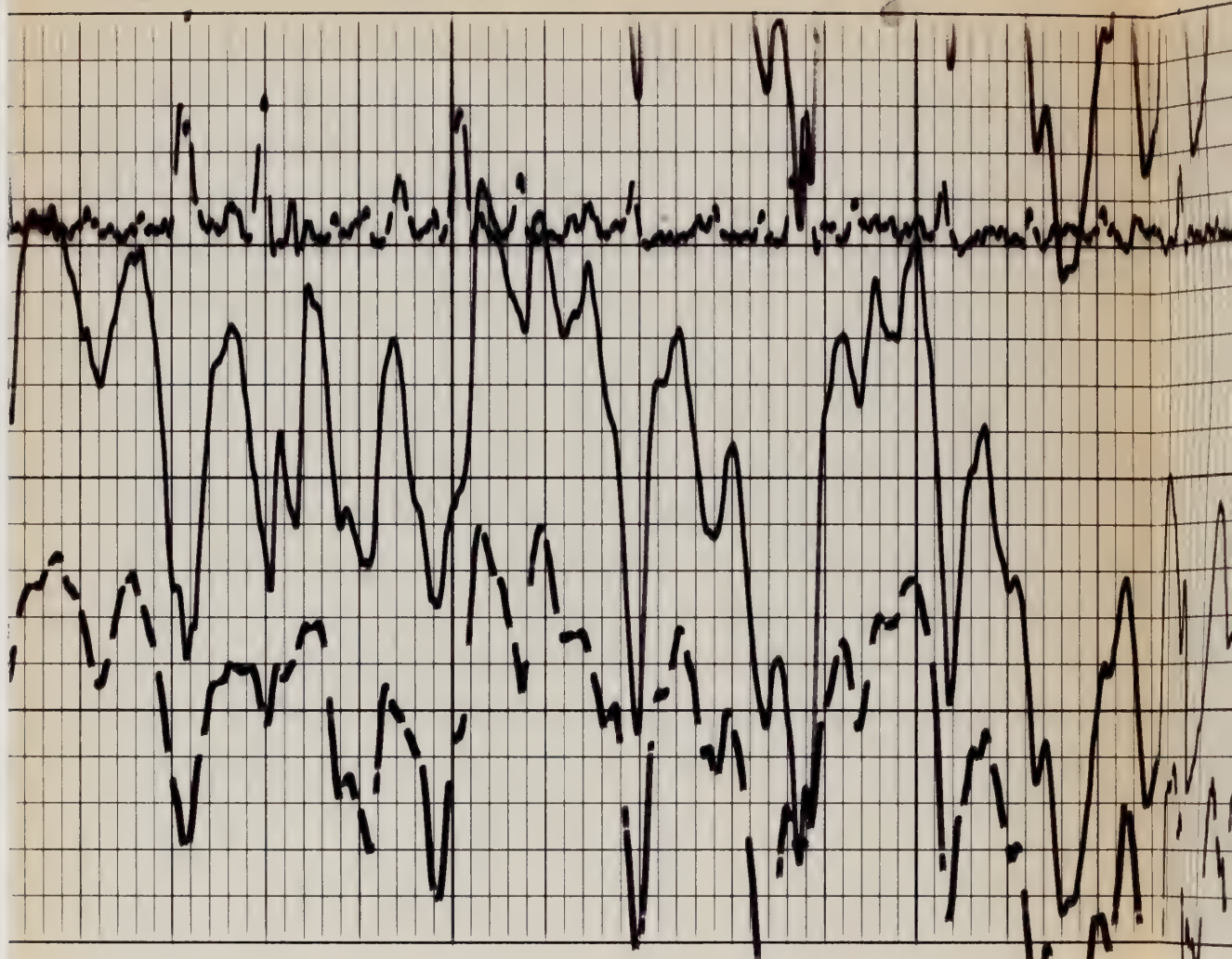
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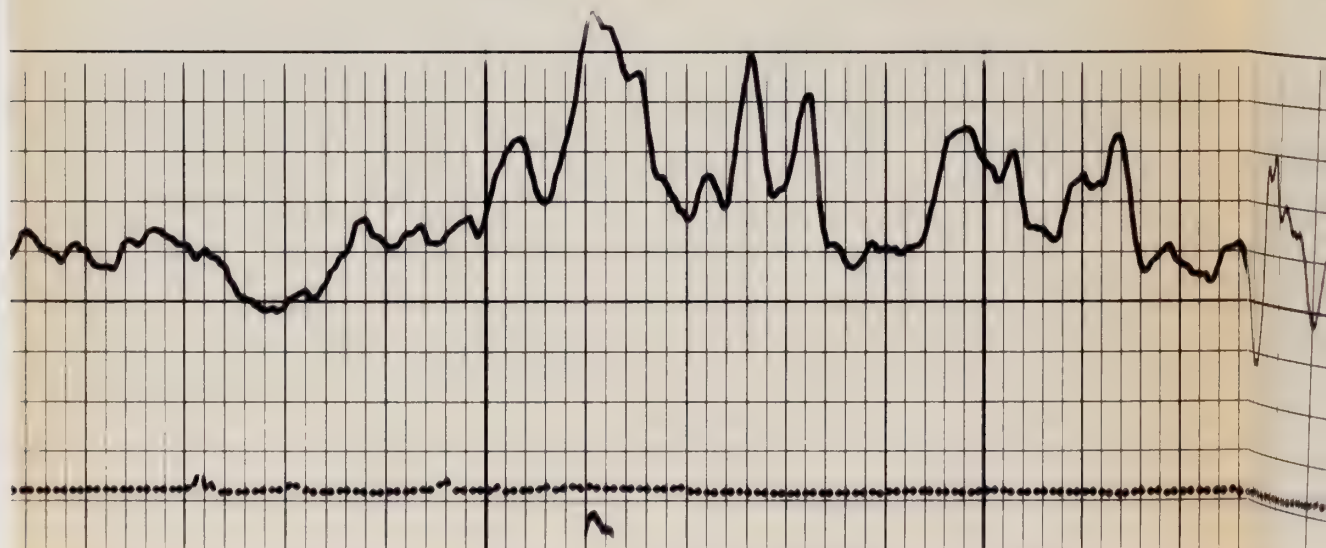


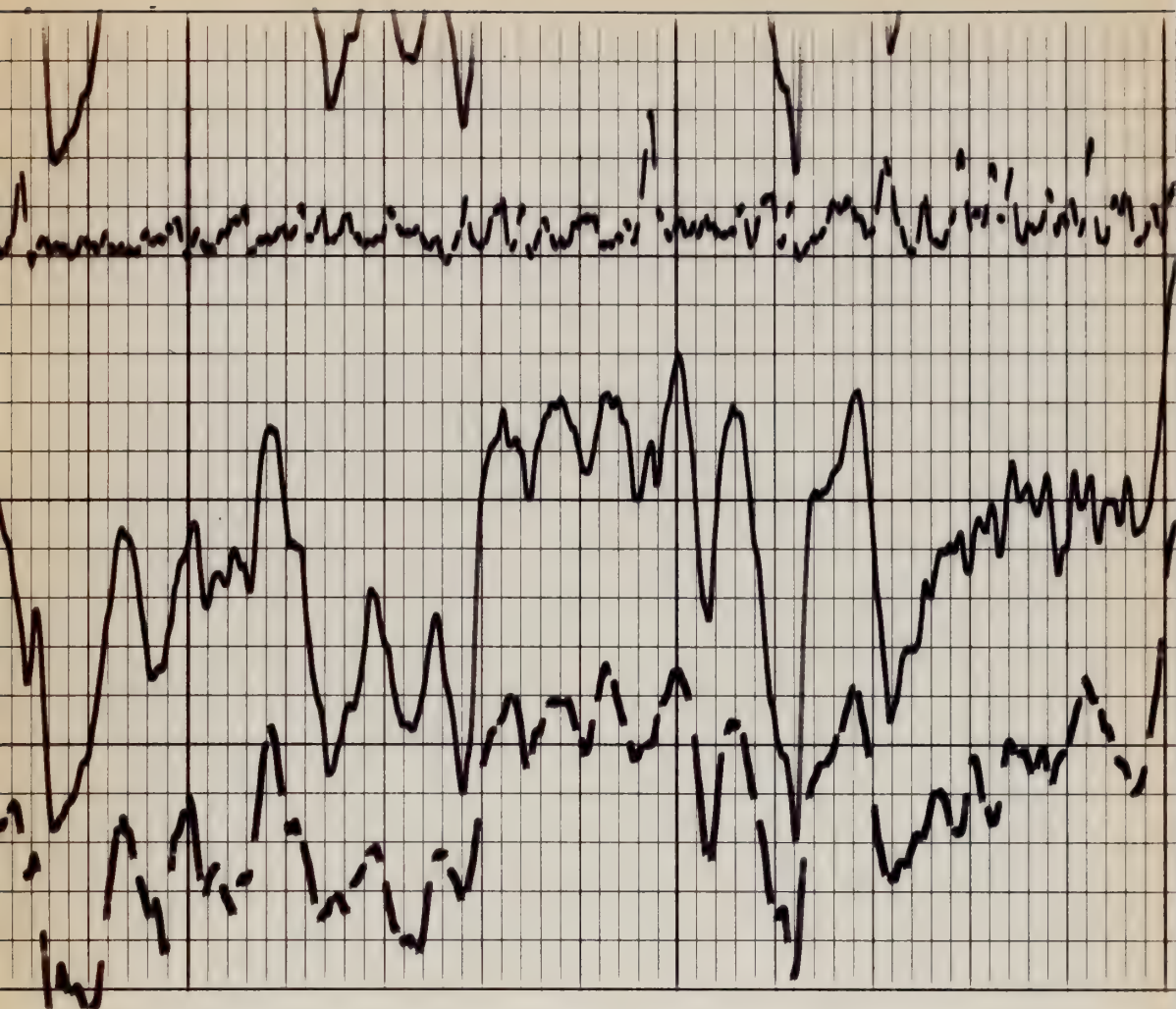
1200





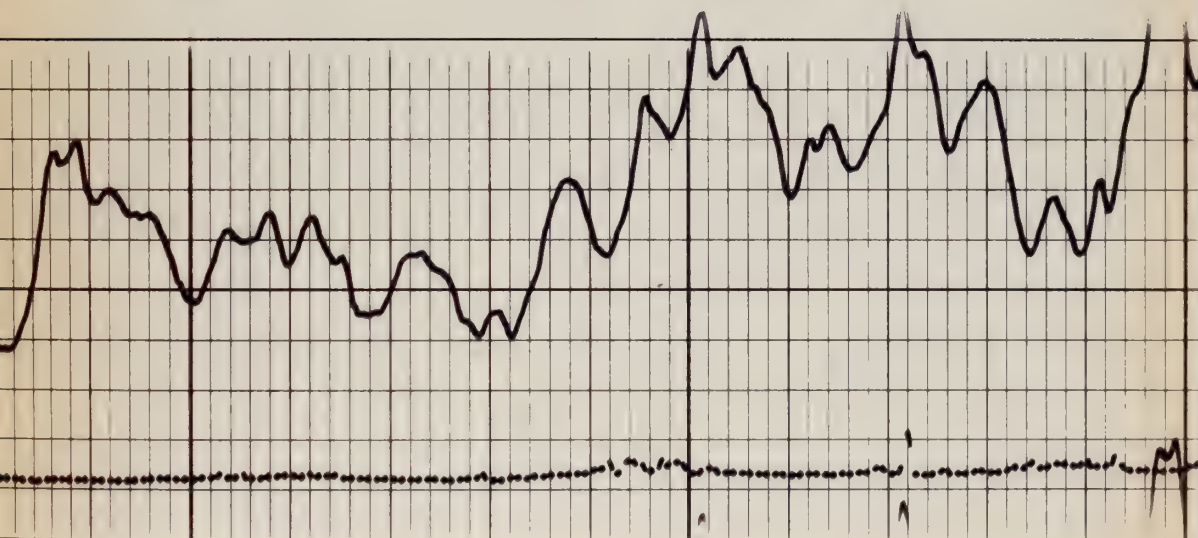
1300

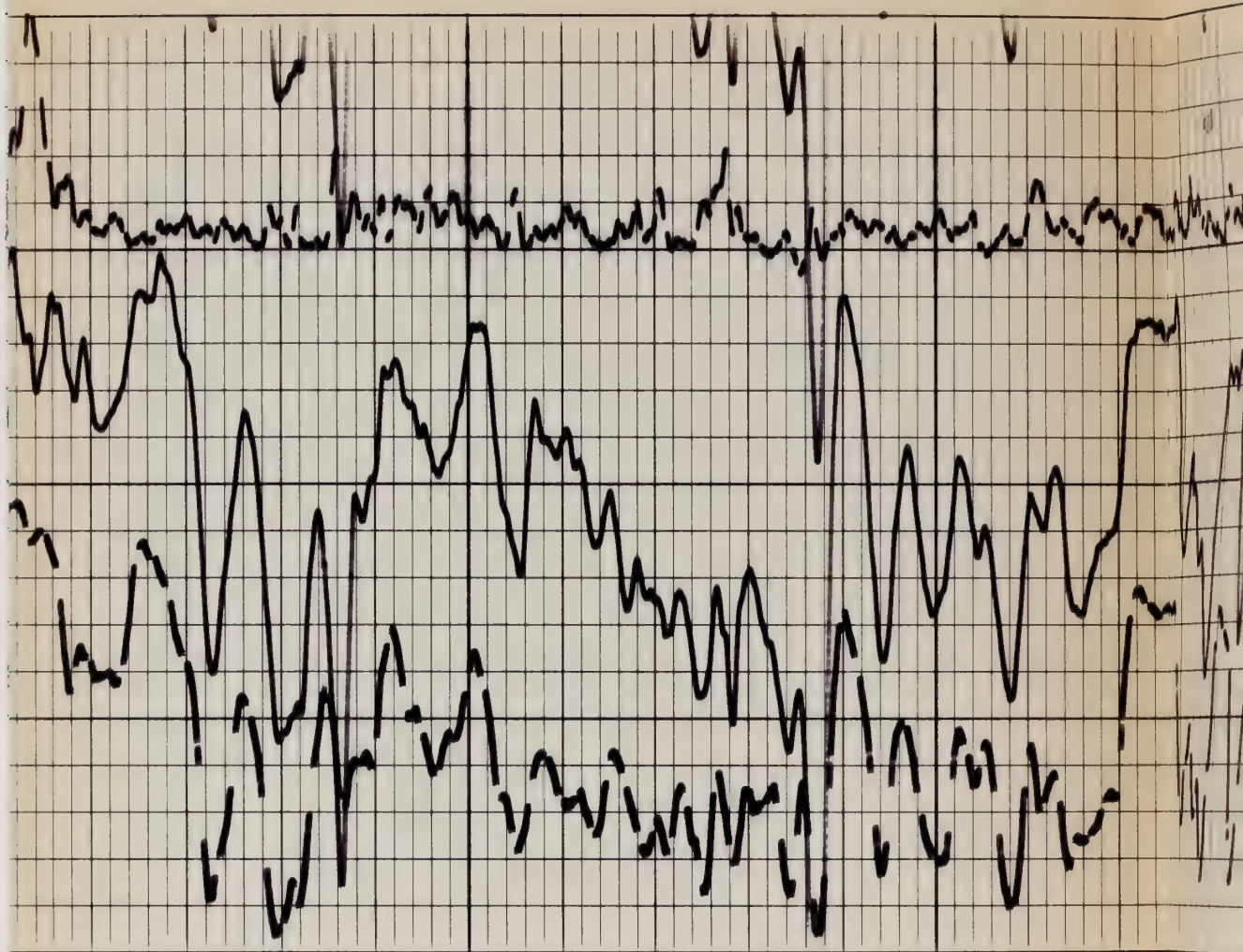




1400

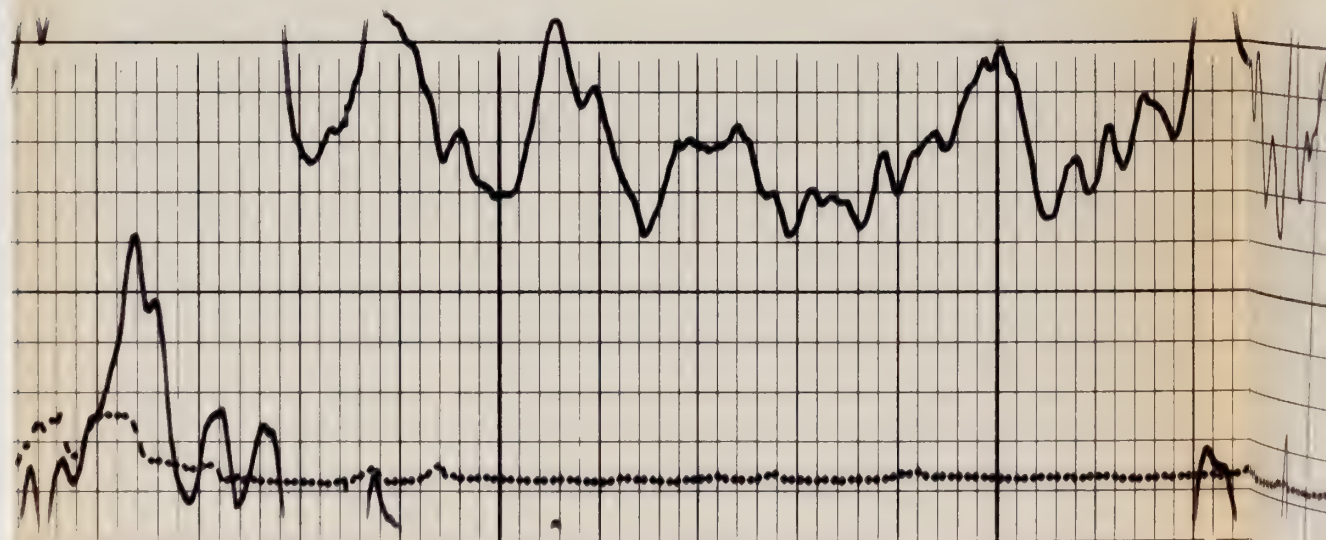
150

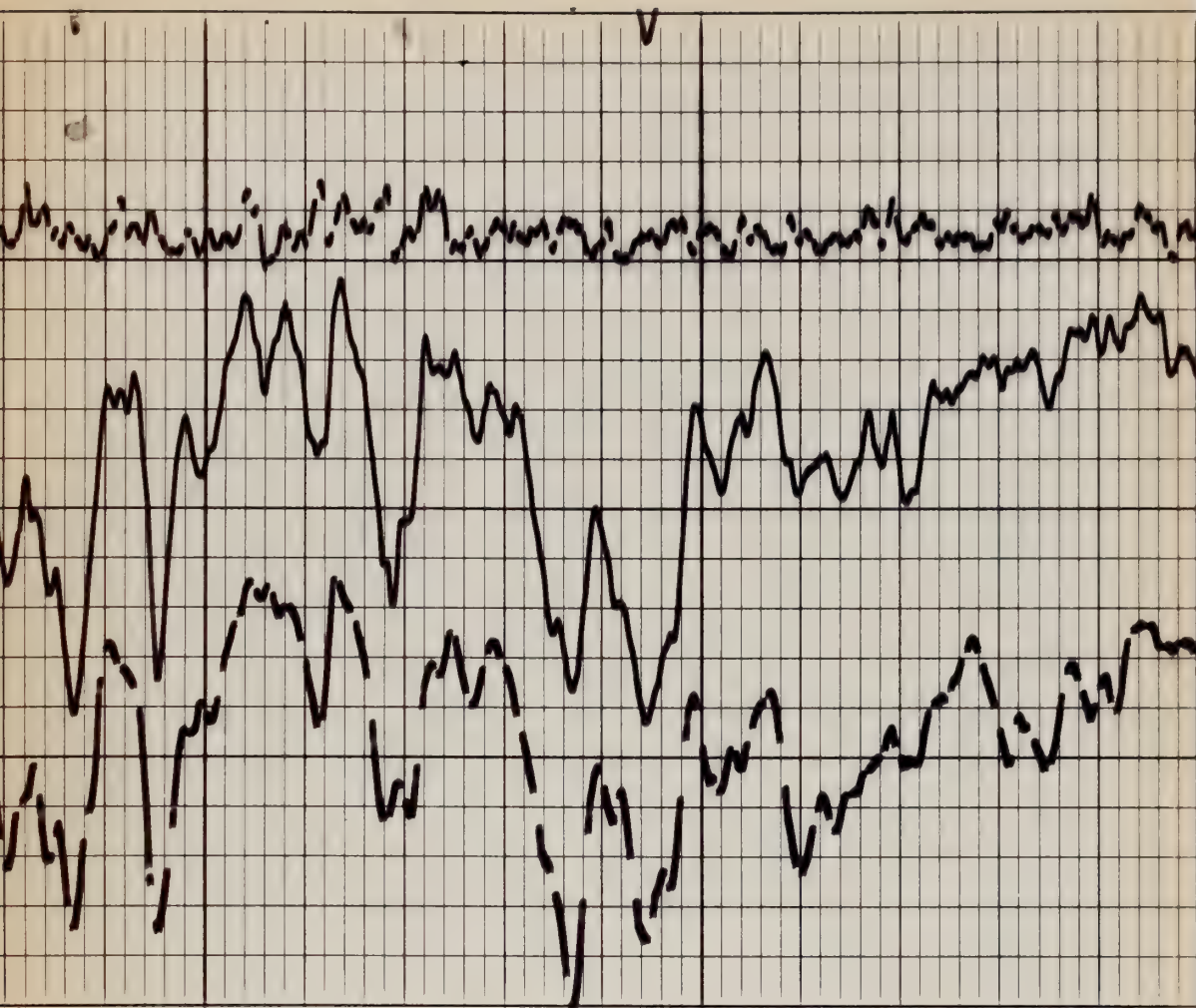




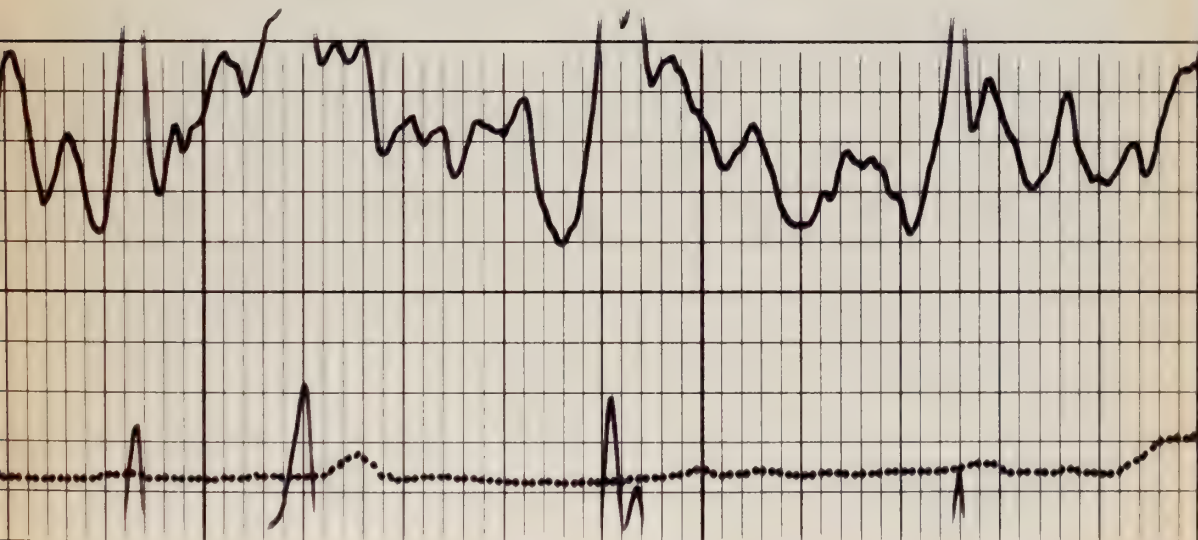
10

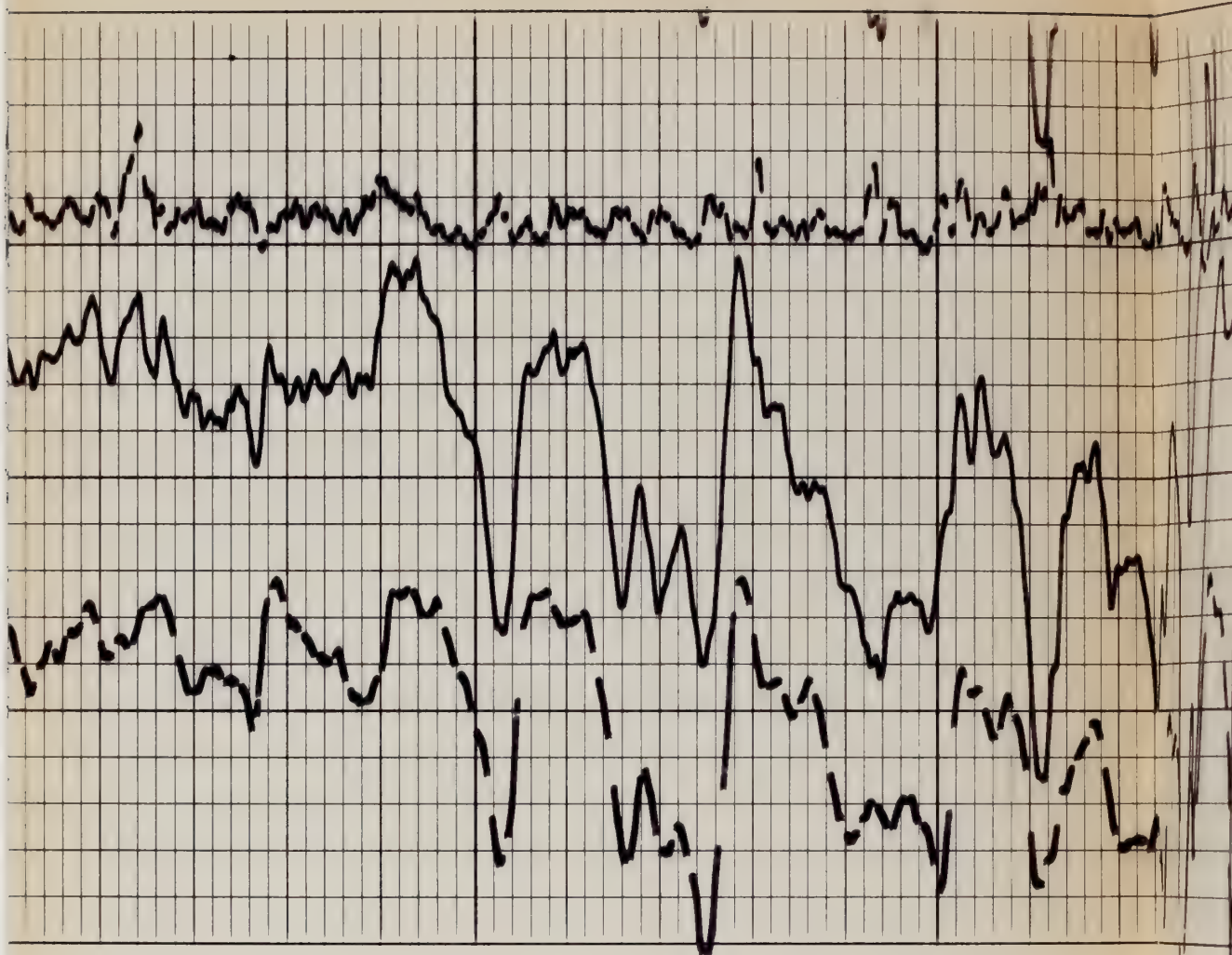
1600



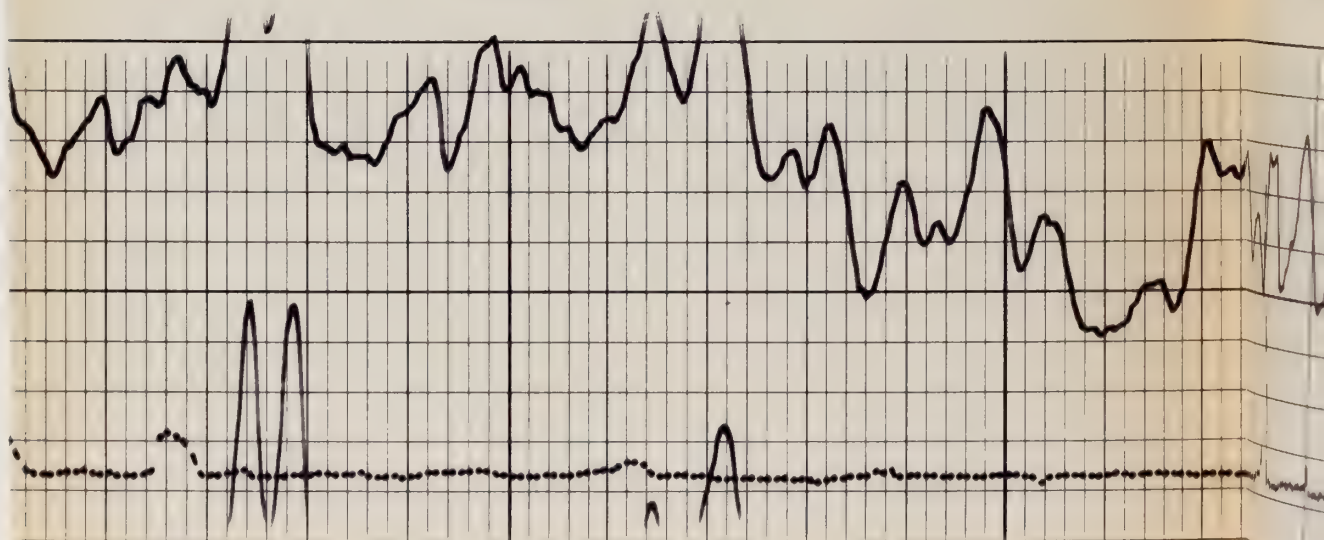


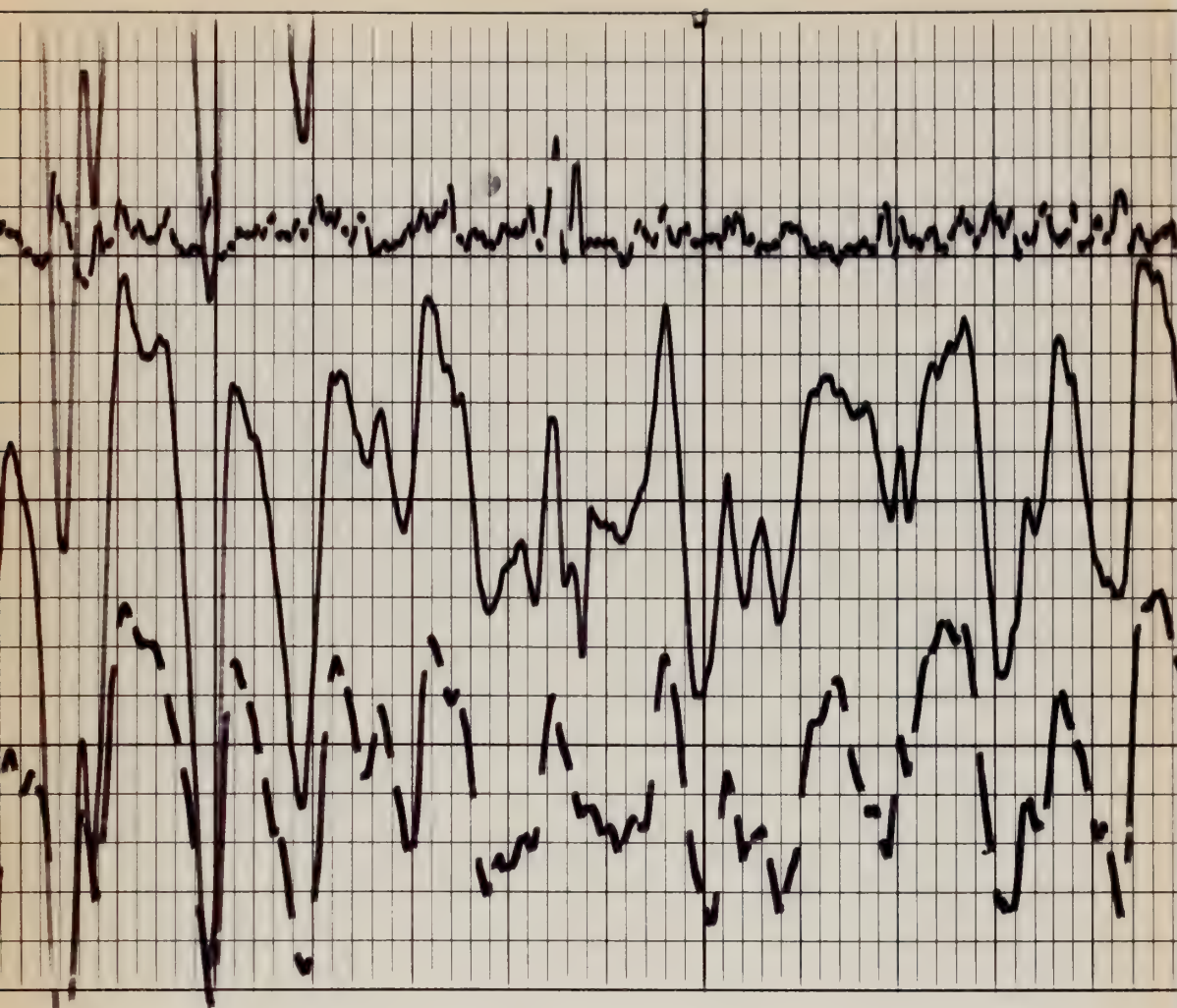
1700





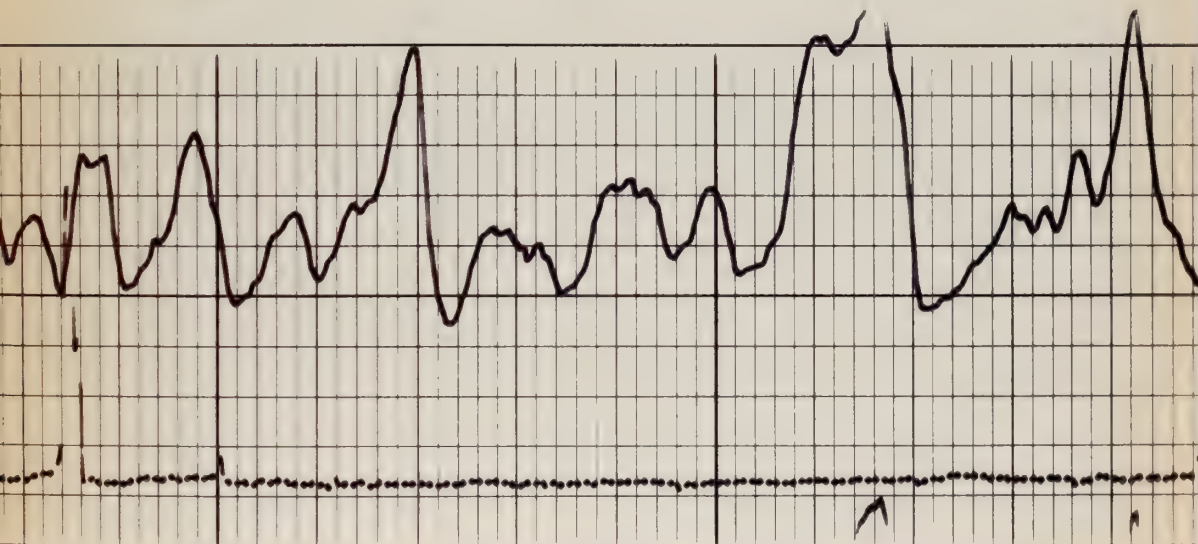
1800

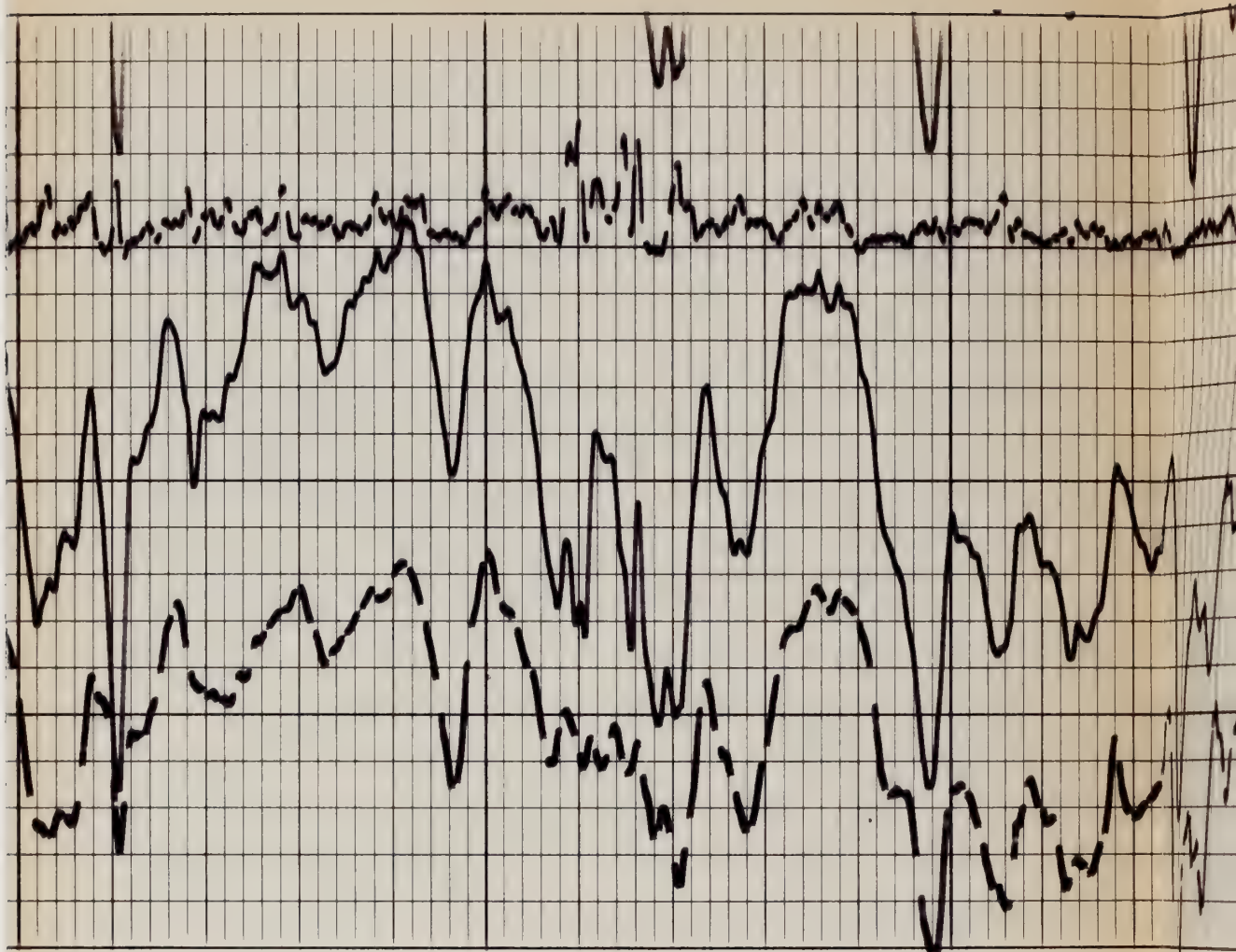




1900

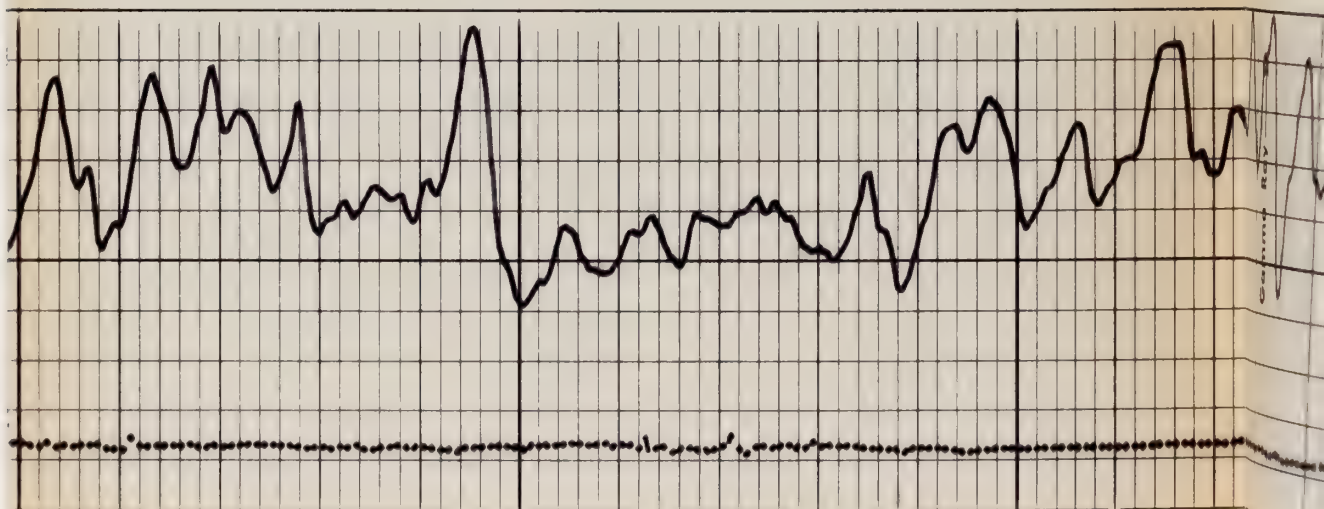
2

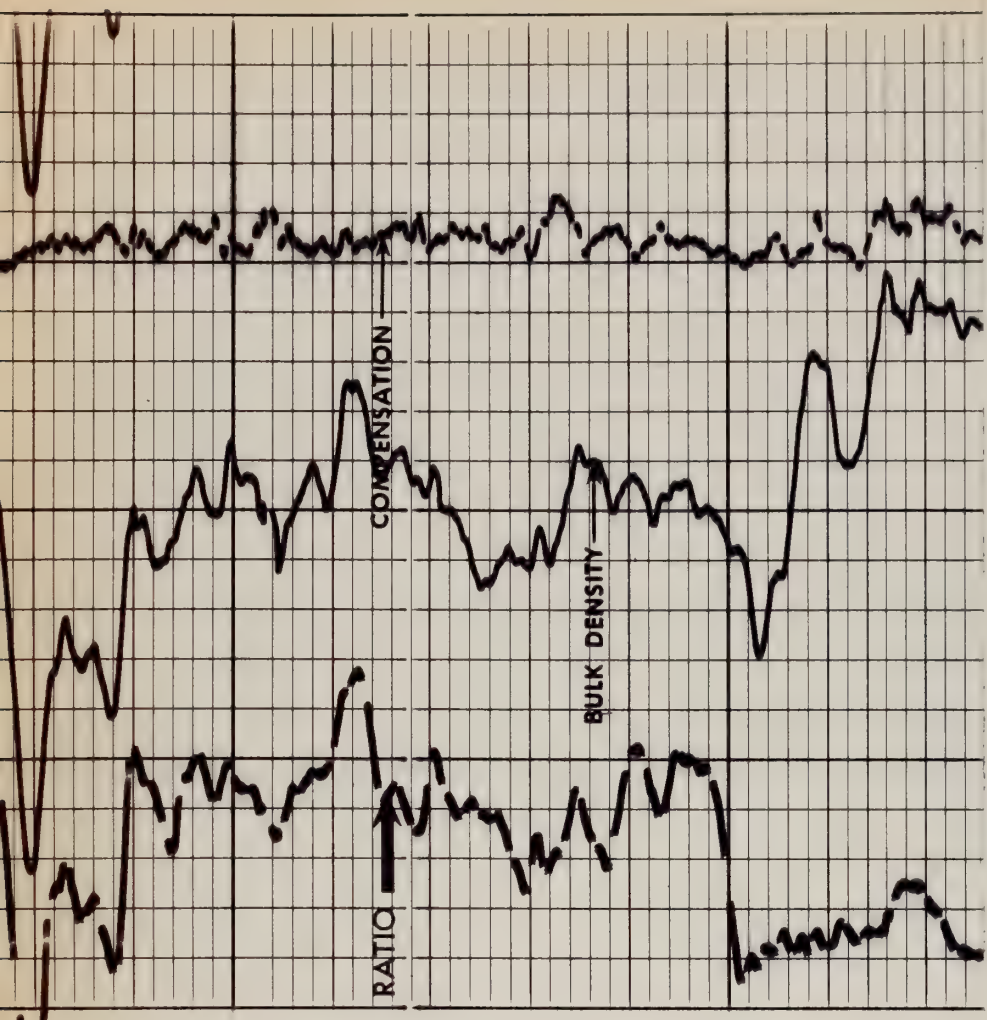




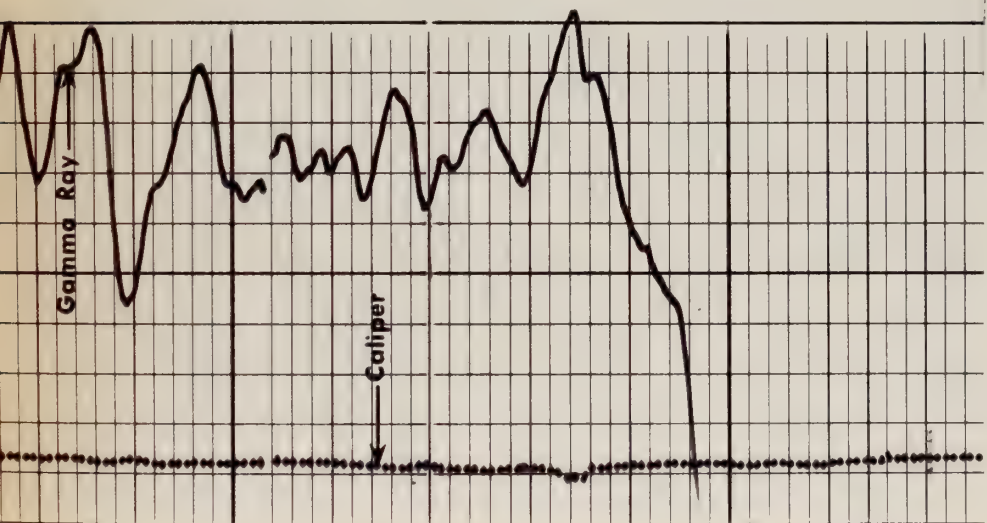
000

2100





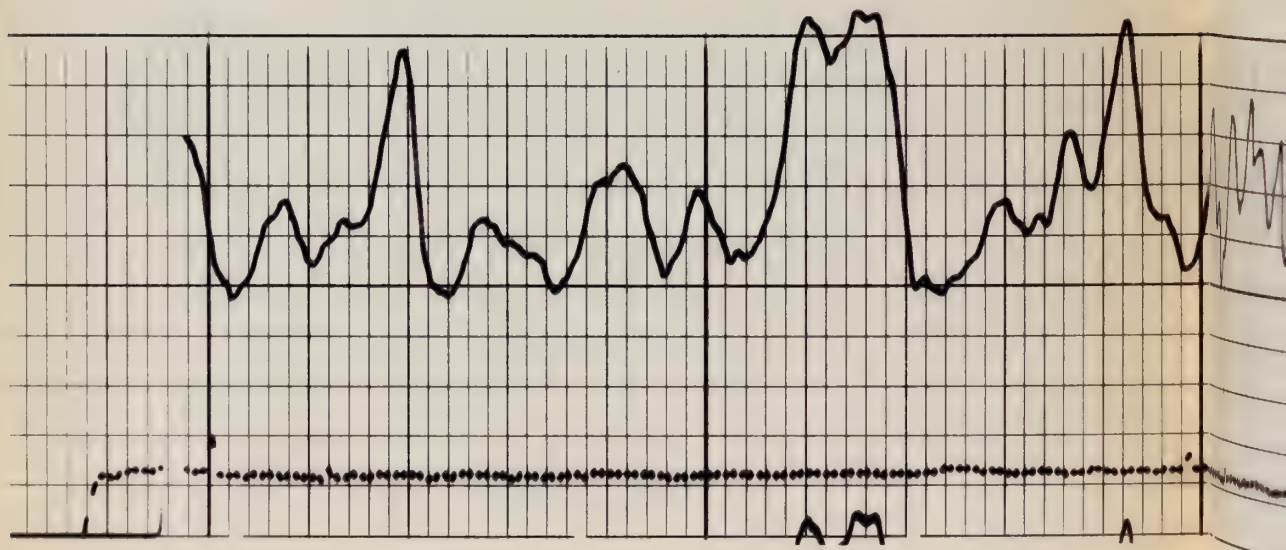
2200

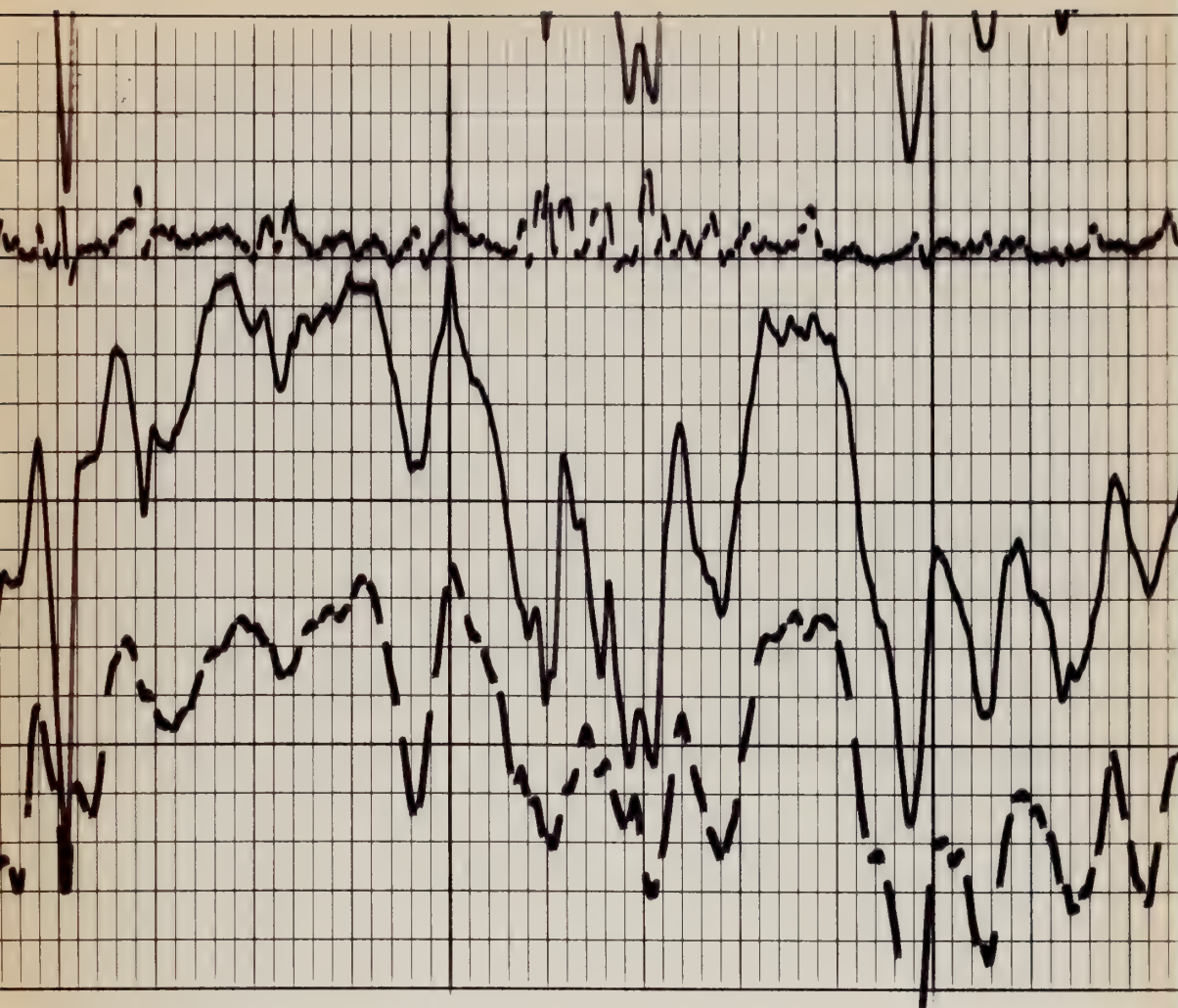


REPEAT SECTION

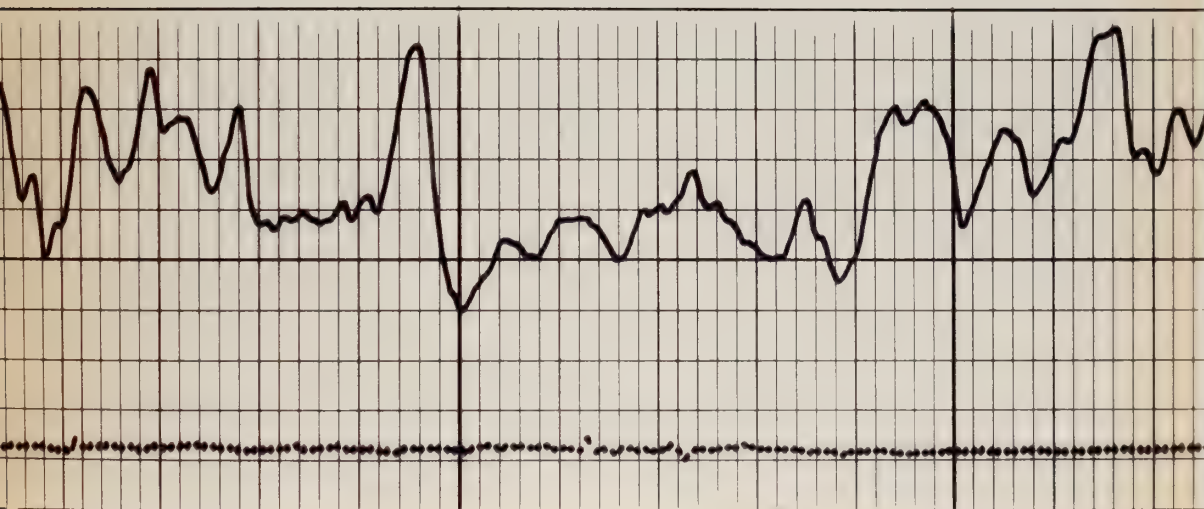
1900

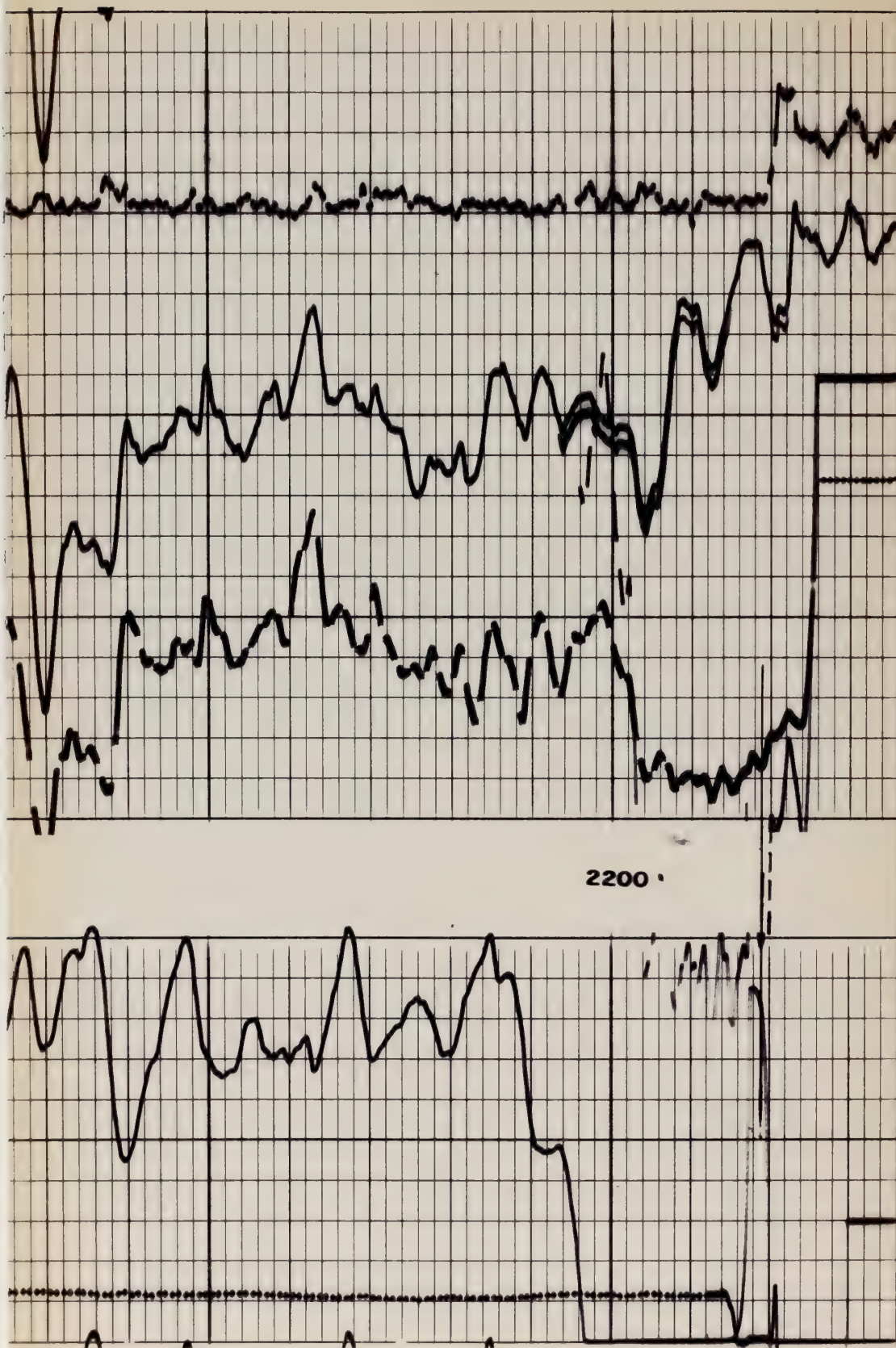
2000





2100





2200

DETAIL LOG

5" = 100'

DENSITY POROSITY INDEX %
LIMESTONE MATRIX

DEPTH

CALIPER
HOLE DIAM IN INCHES

1.0

3.0

4.5

6.0

1.5

CALIBER

HOLE DIAM. IN INCHES

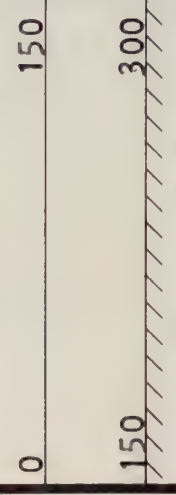
DEPTH

DENSITY POROSITY INDEX %

LIMESTONE MATRIX



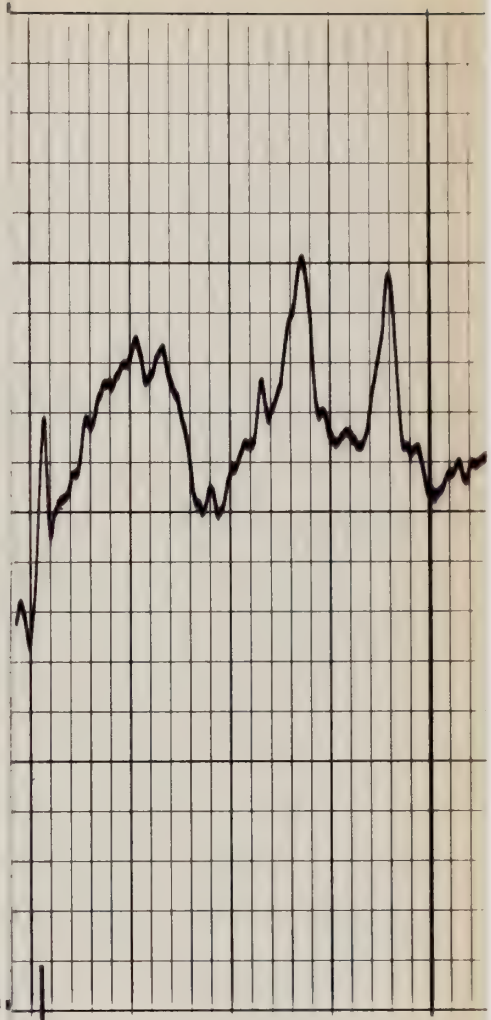
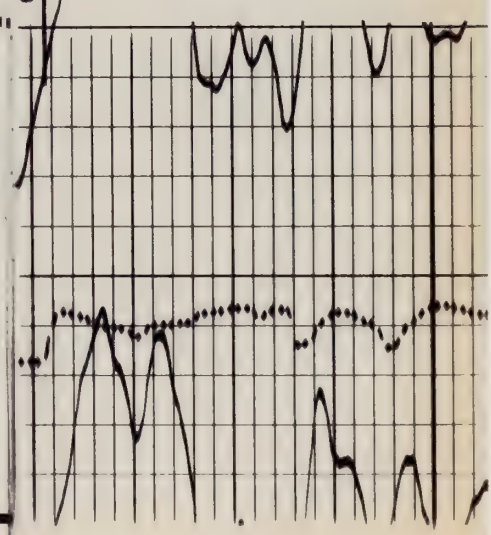
GAMMA RAY
API UNITS

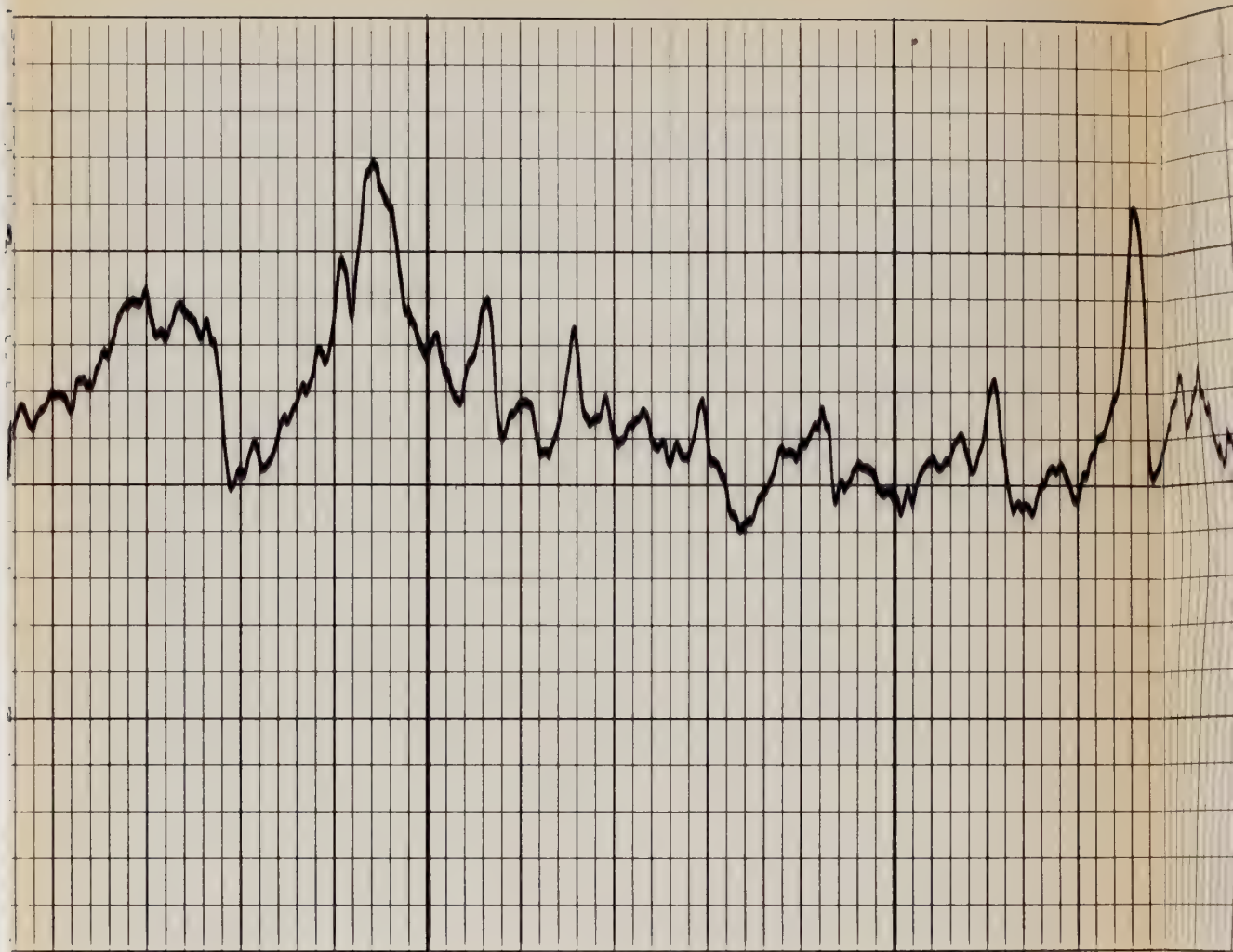


NEUTRON POROSITY INDEX %
LIMESTONE MATRIX

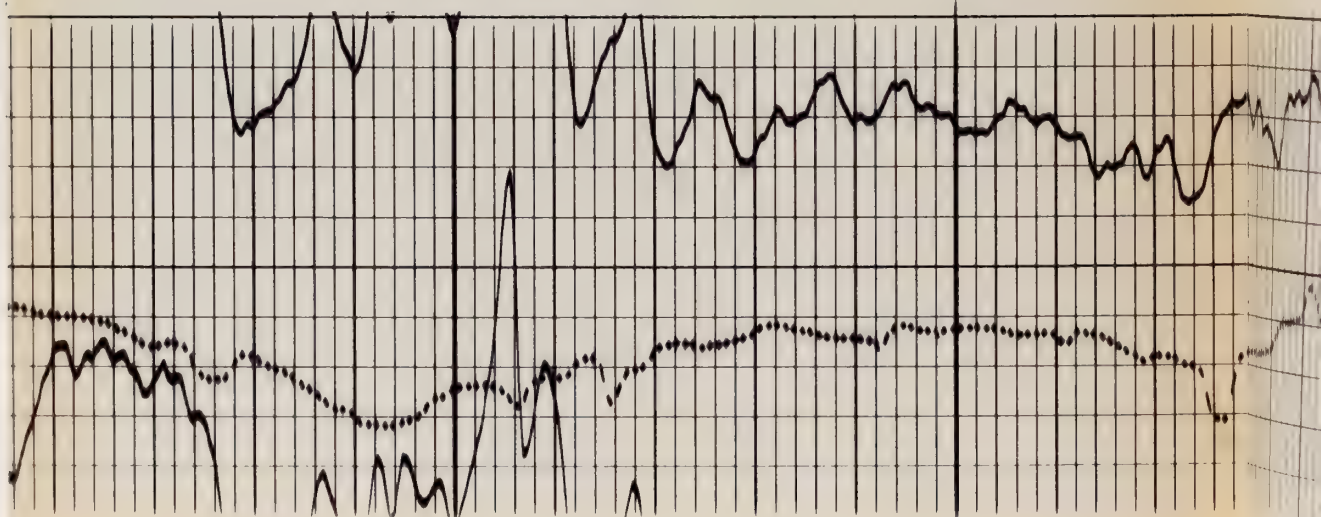


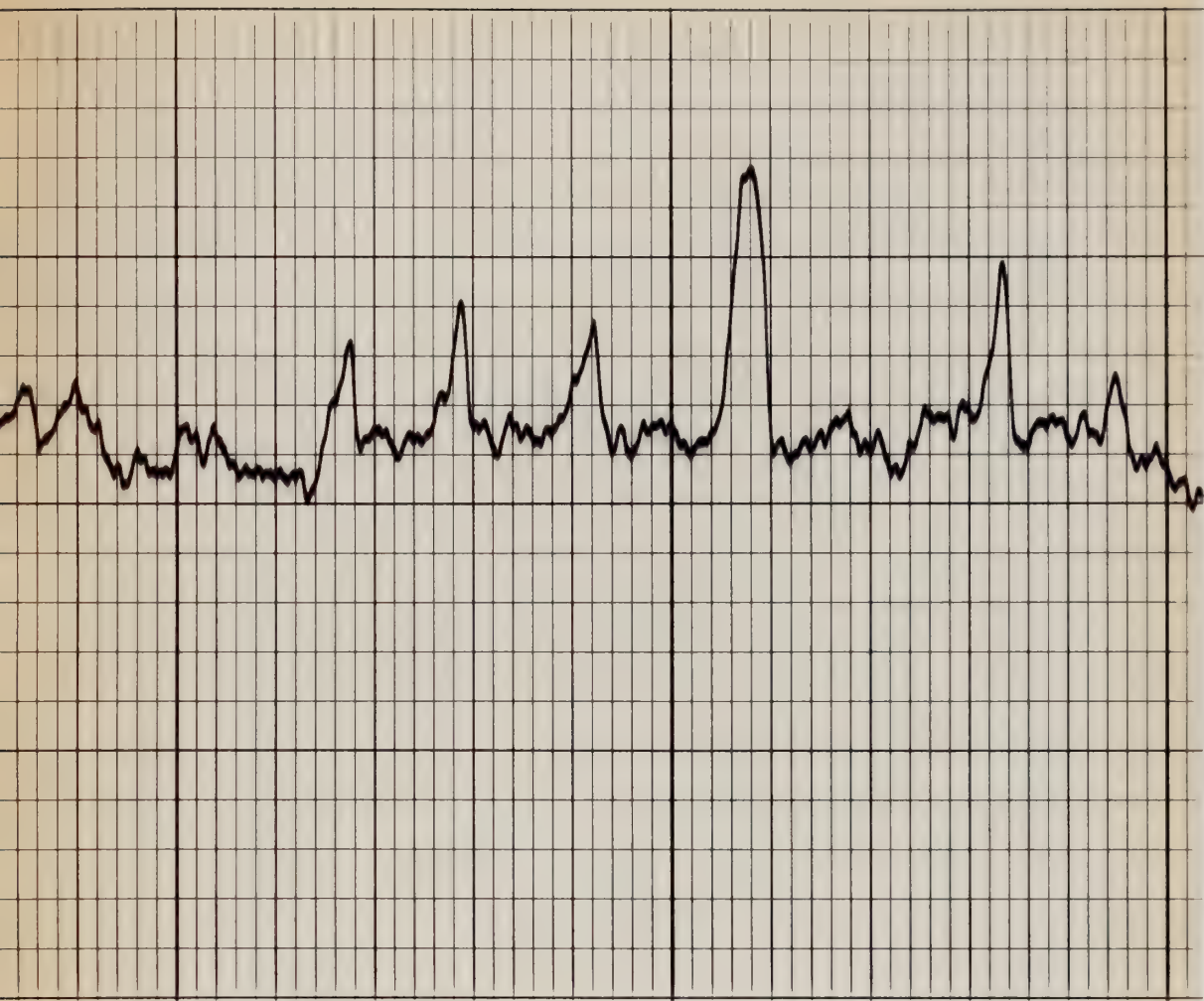
Casing



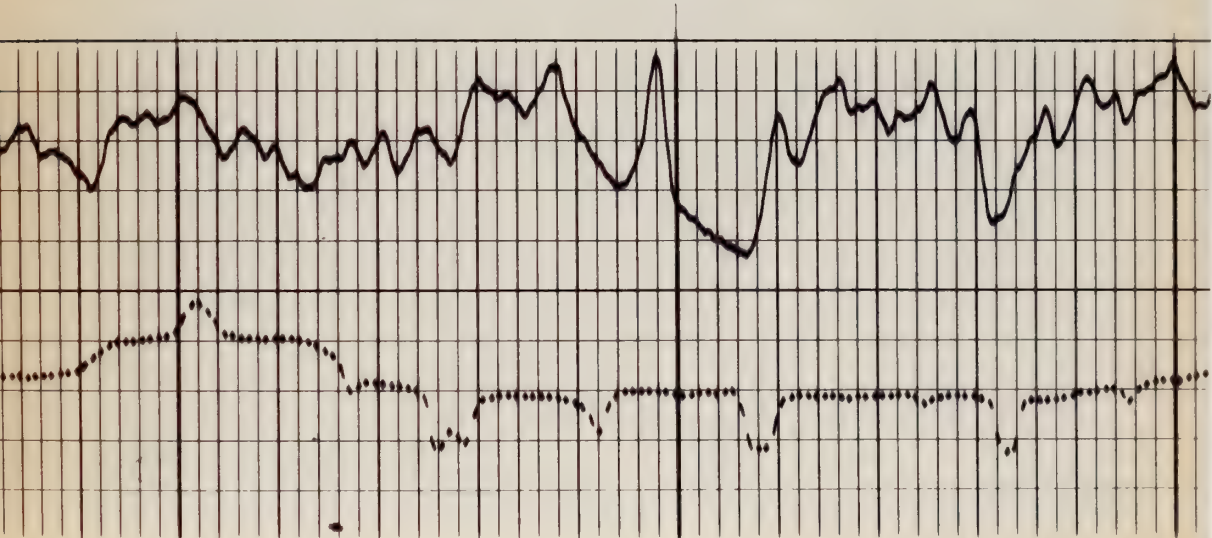


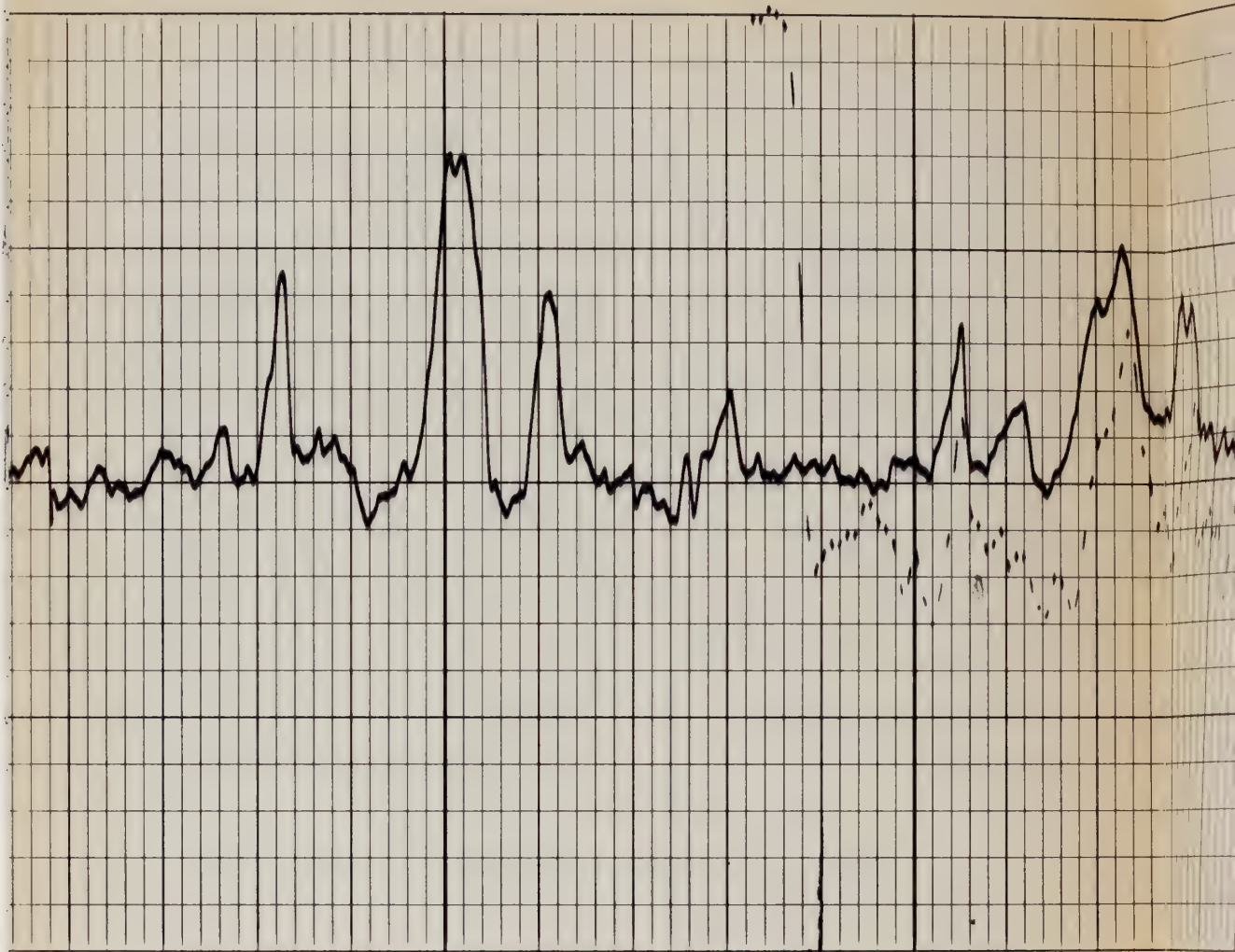
0200





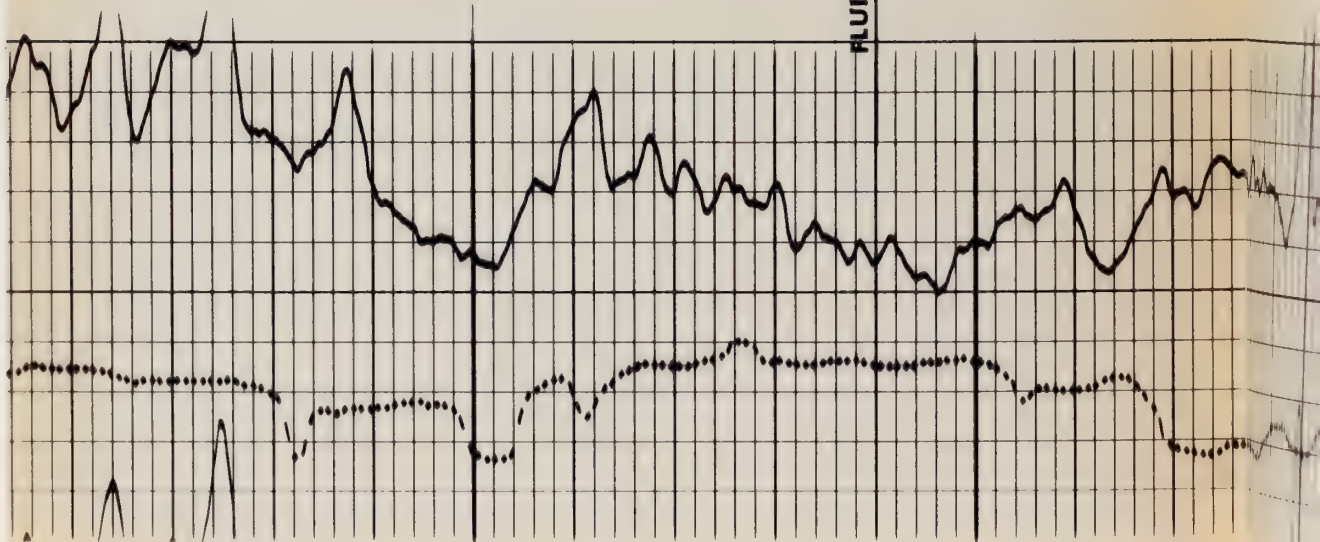
0300

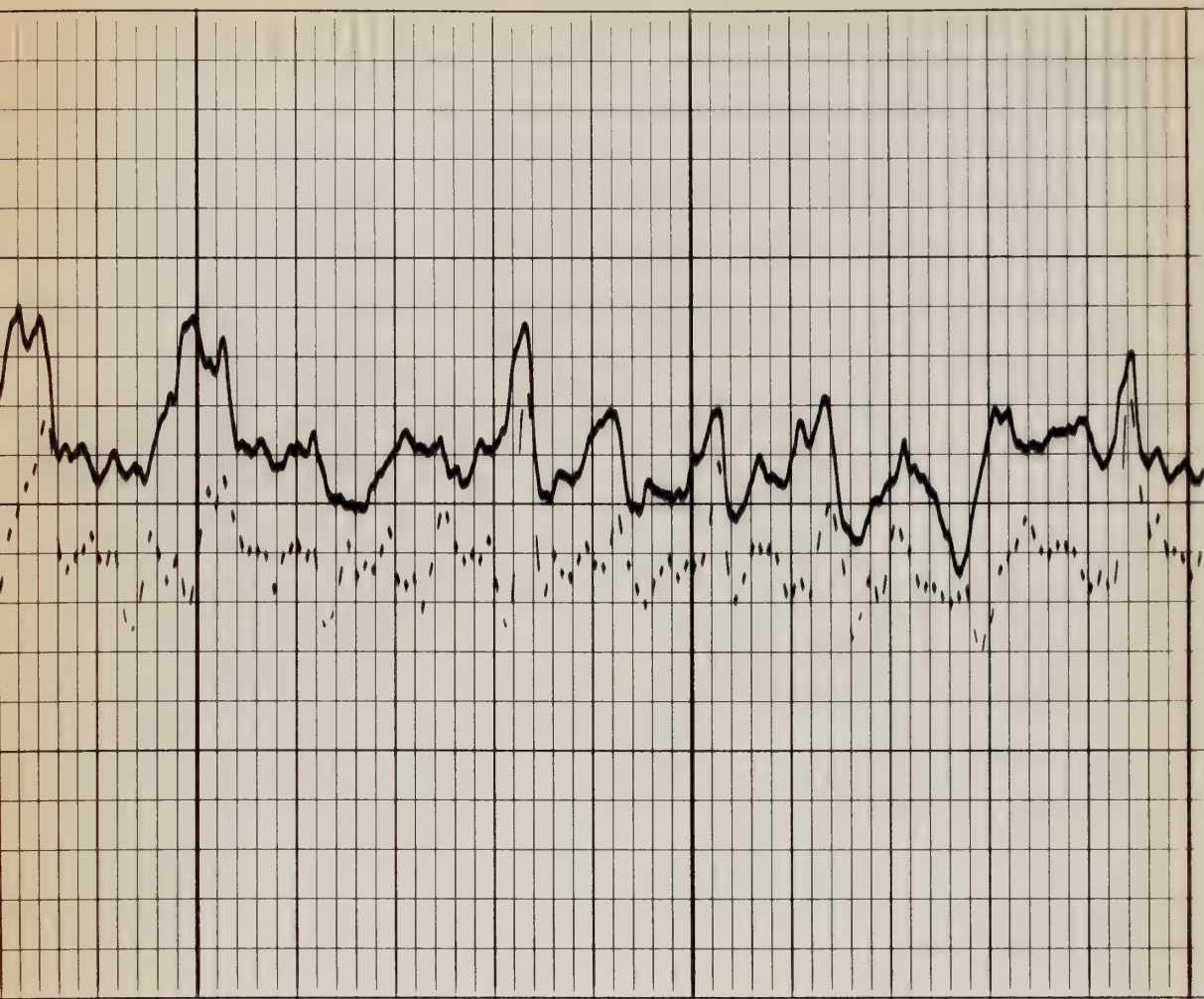




0400

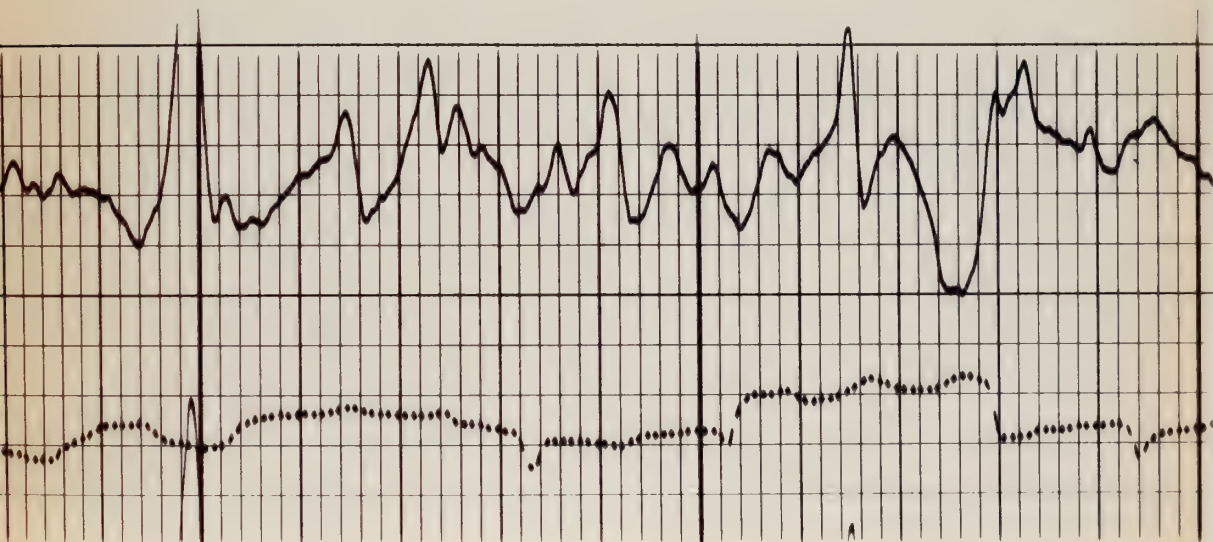
FLUID LEVEL

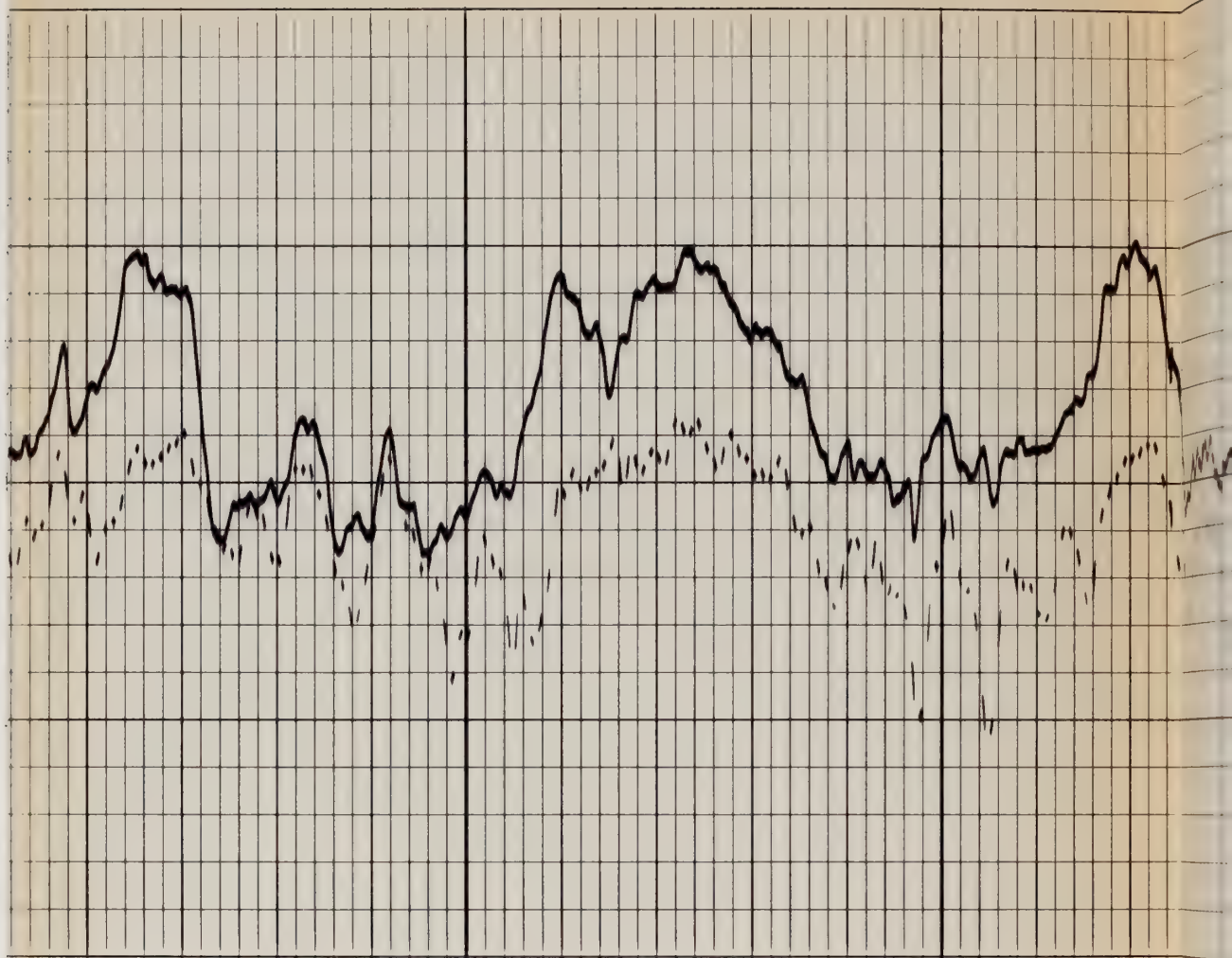




0500

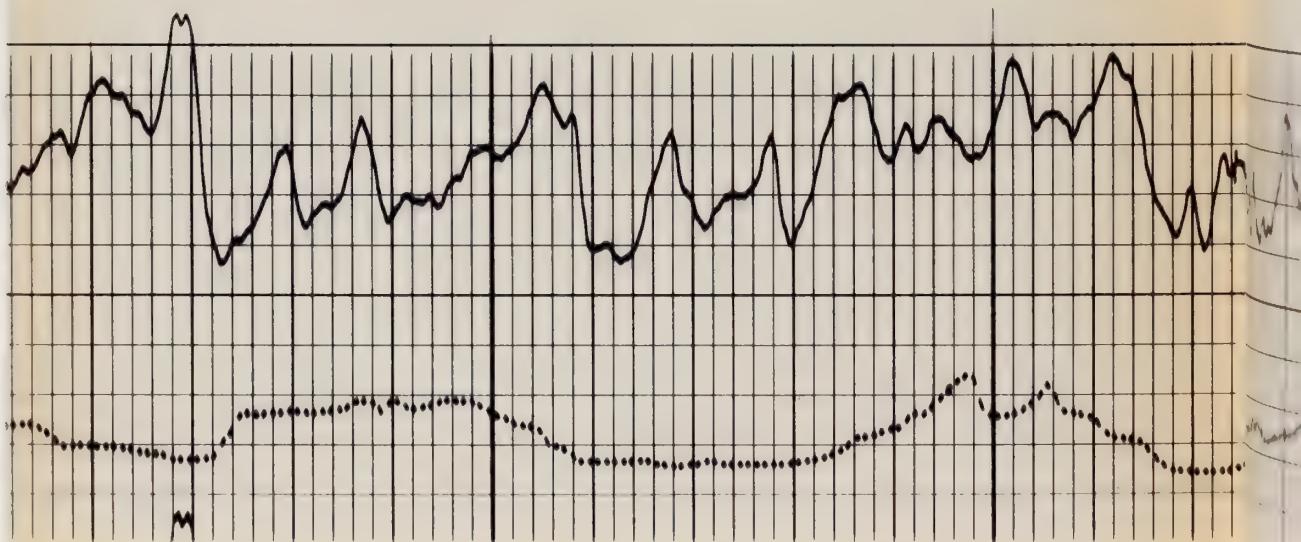
0600

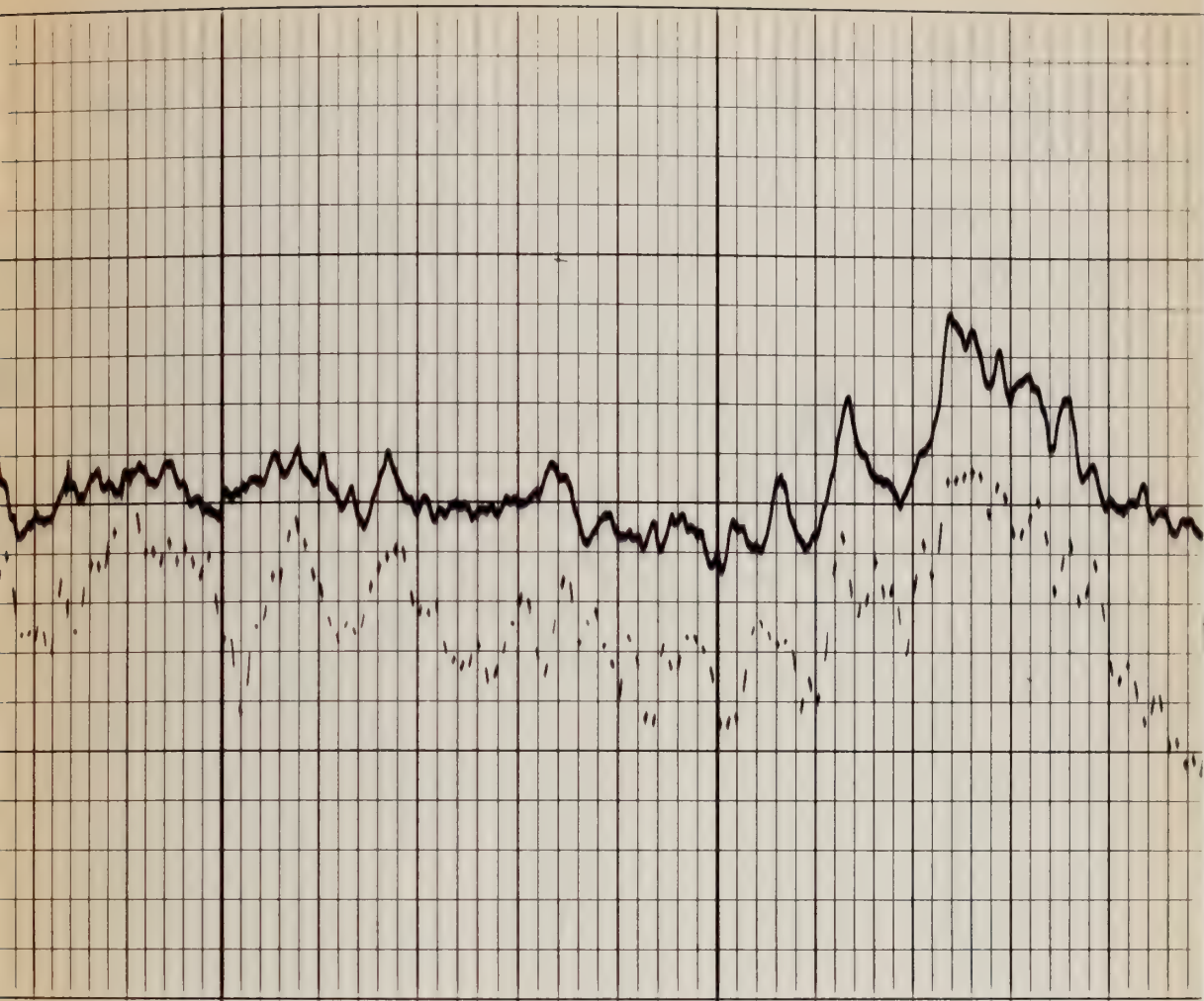




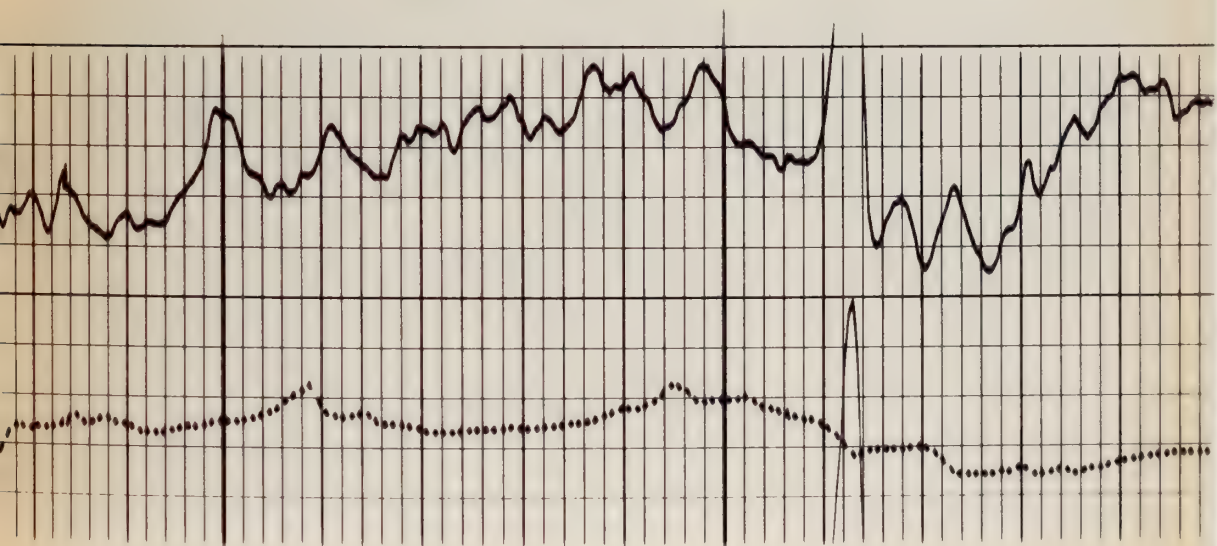
30

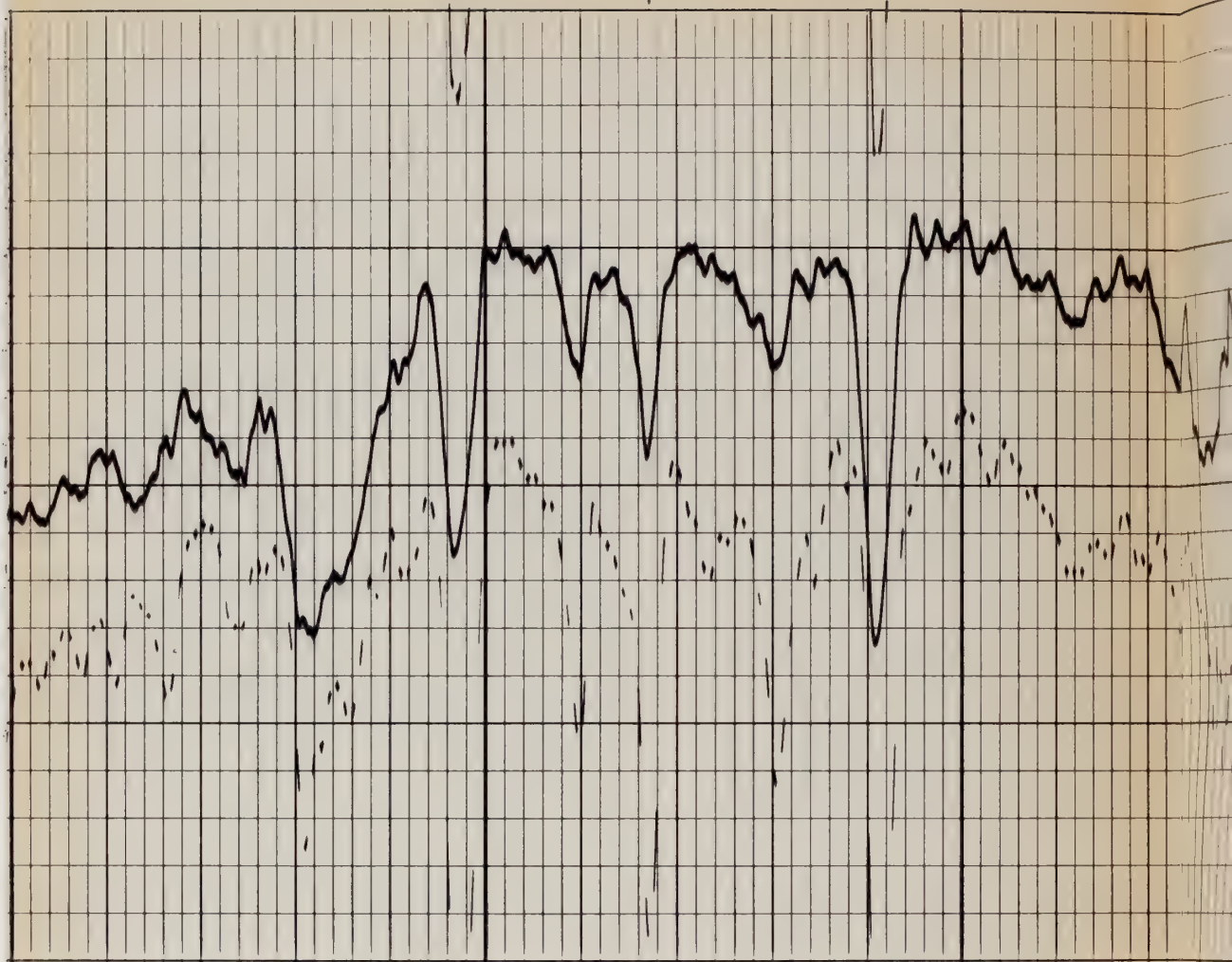
0700



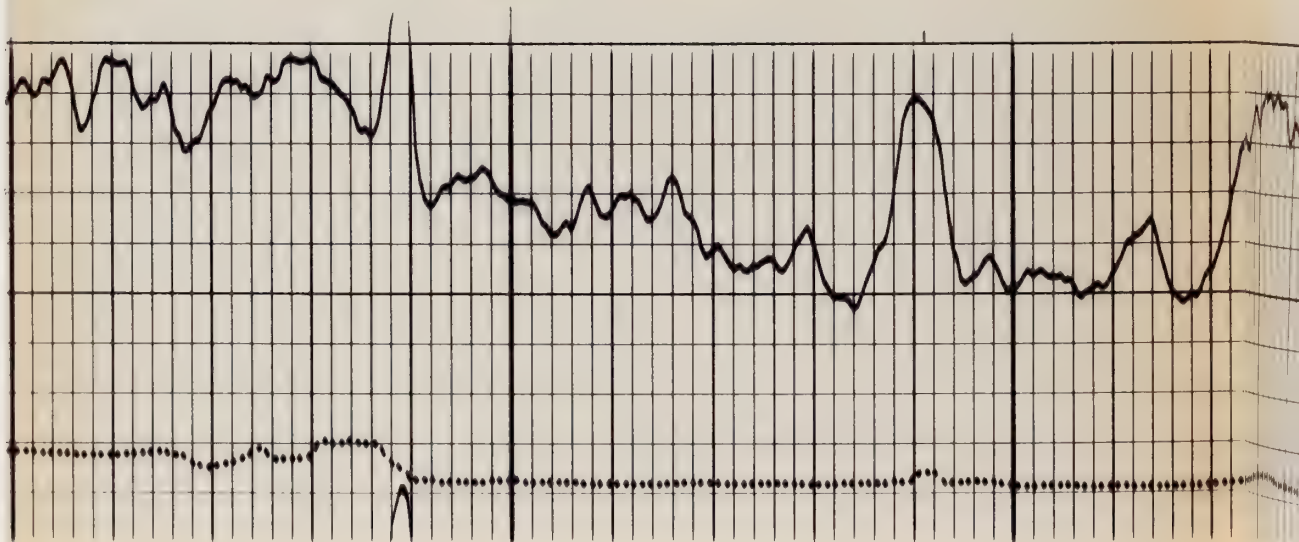


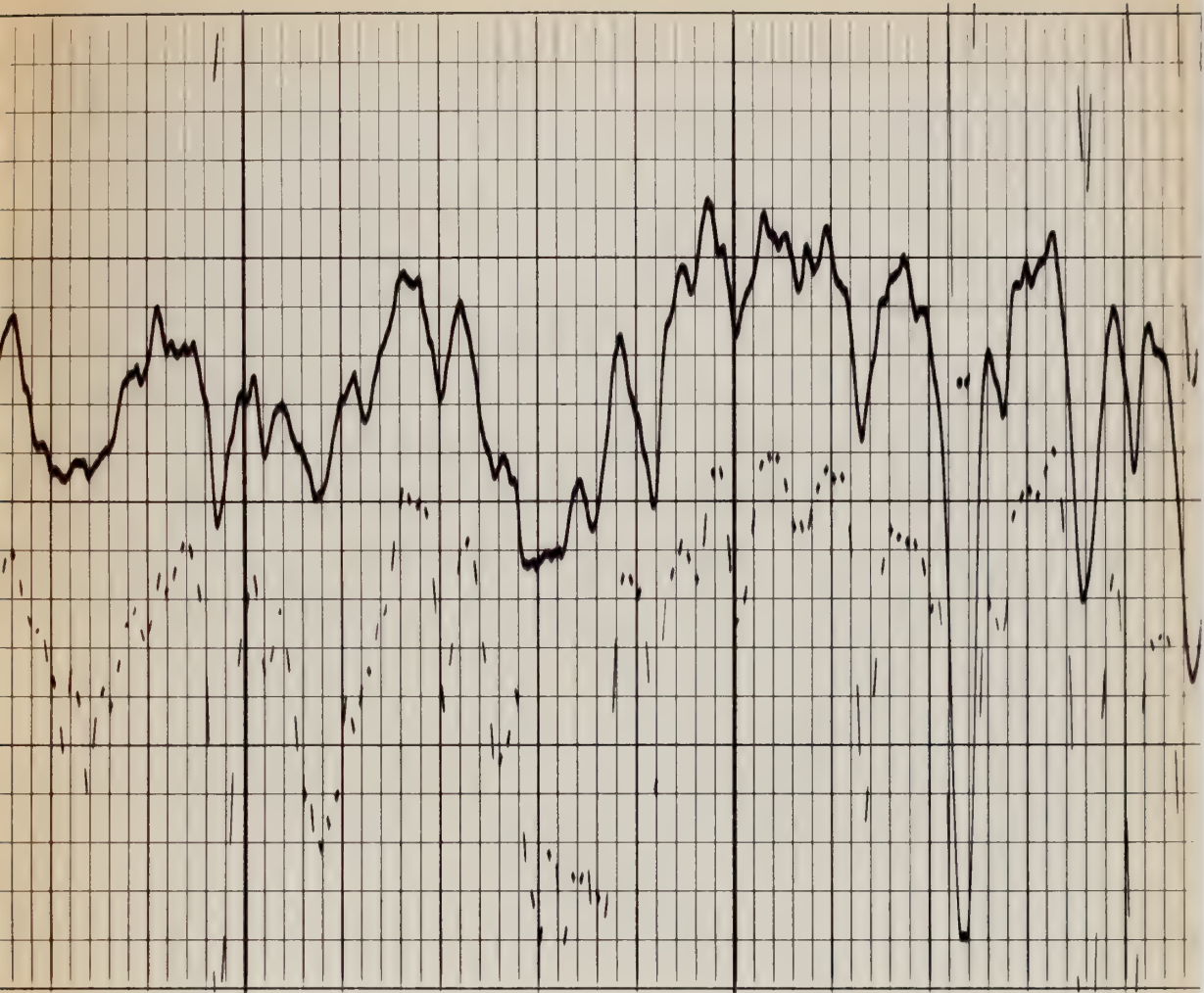
0800



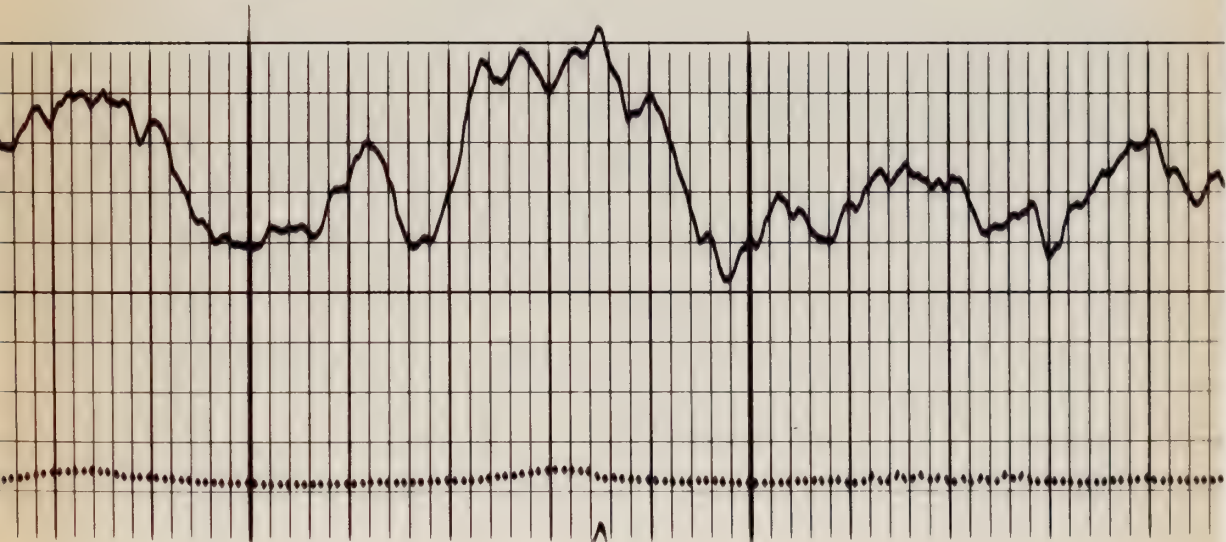


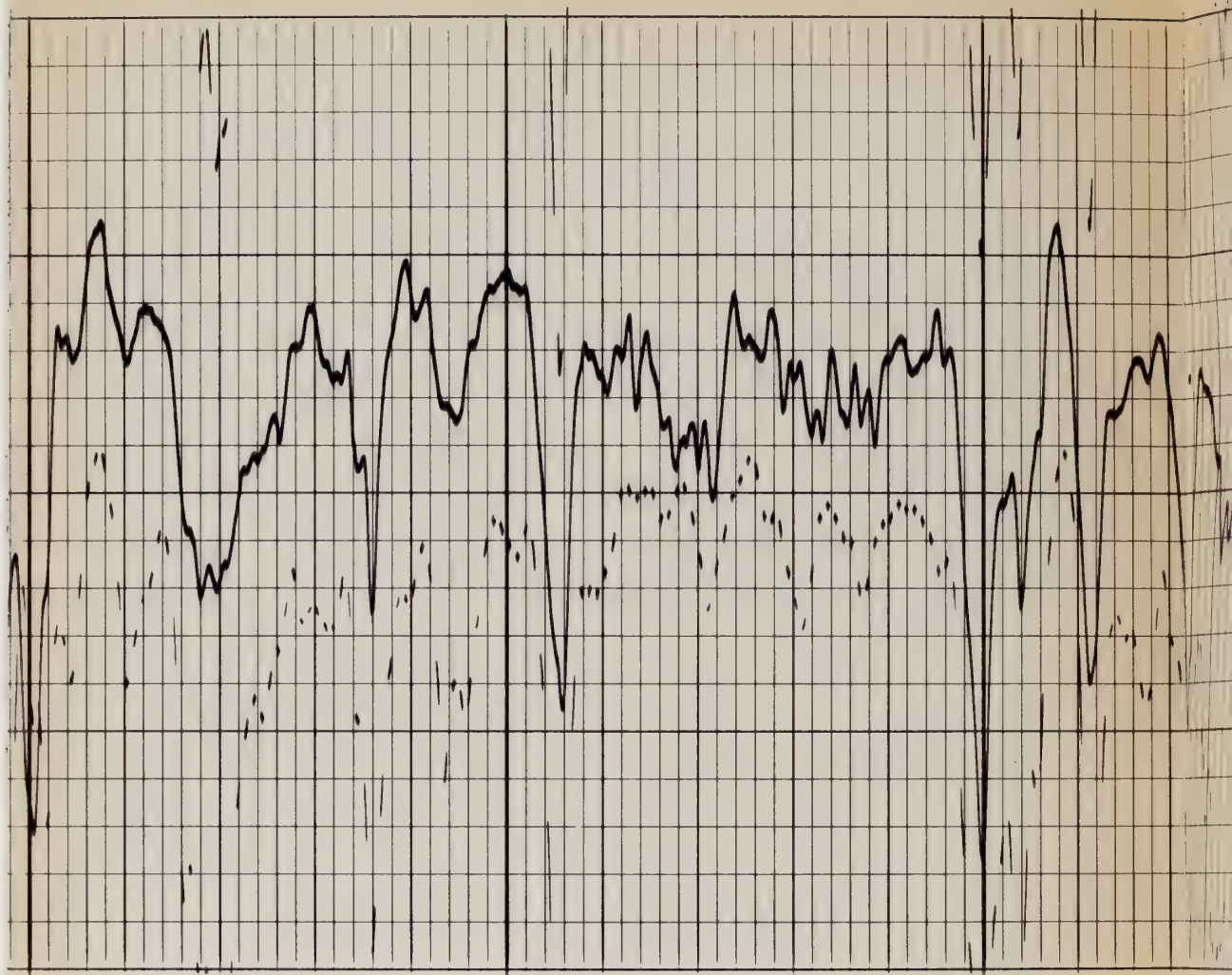
0900





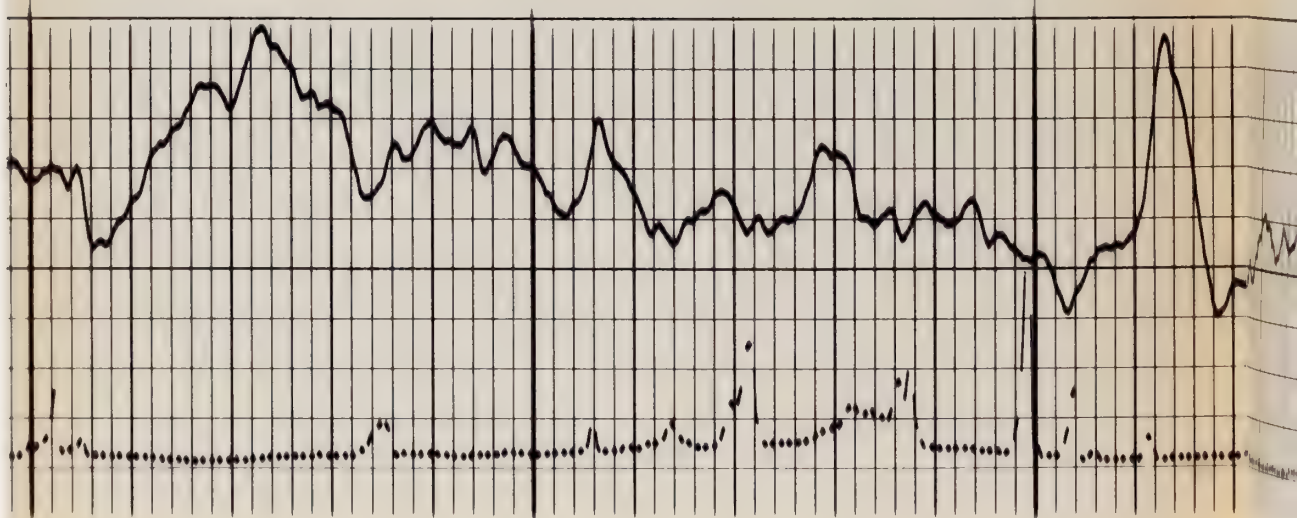
1000

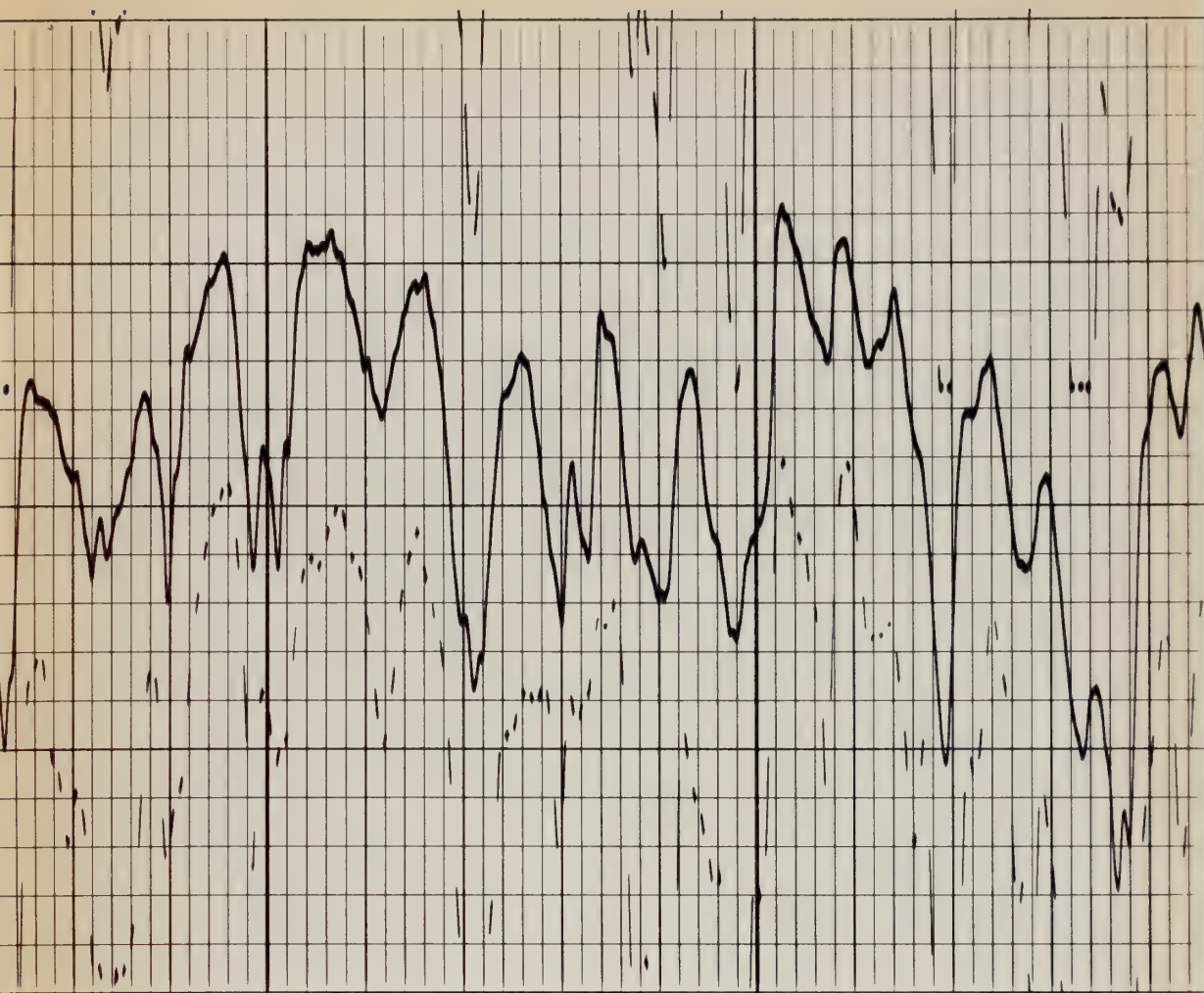




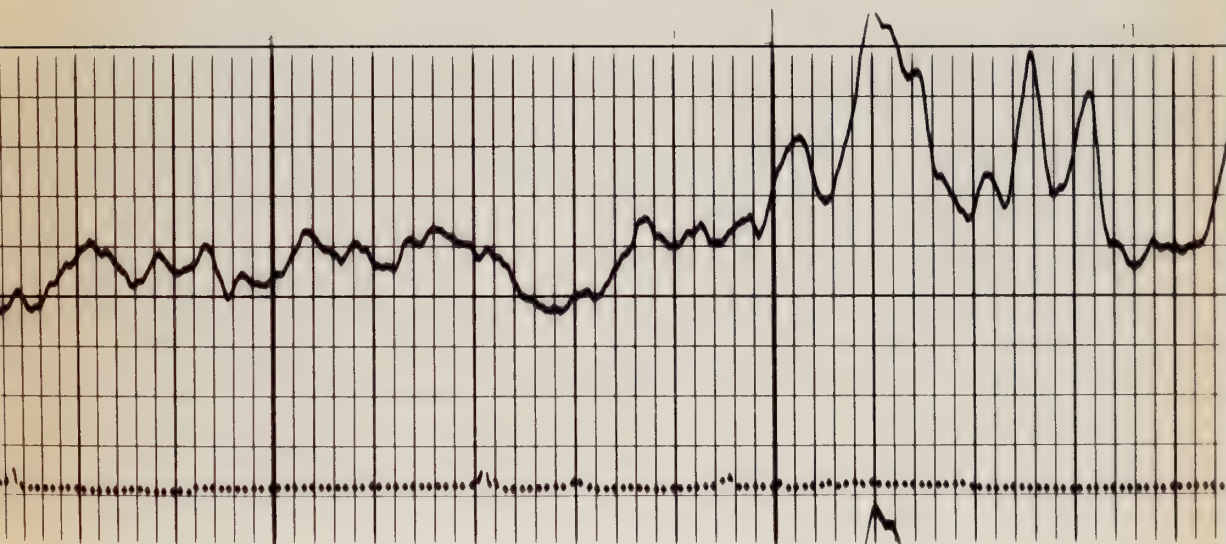
100

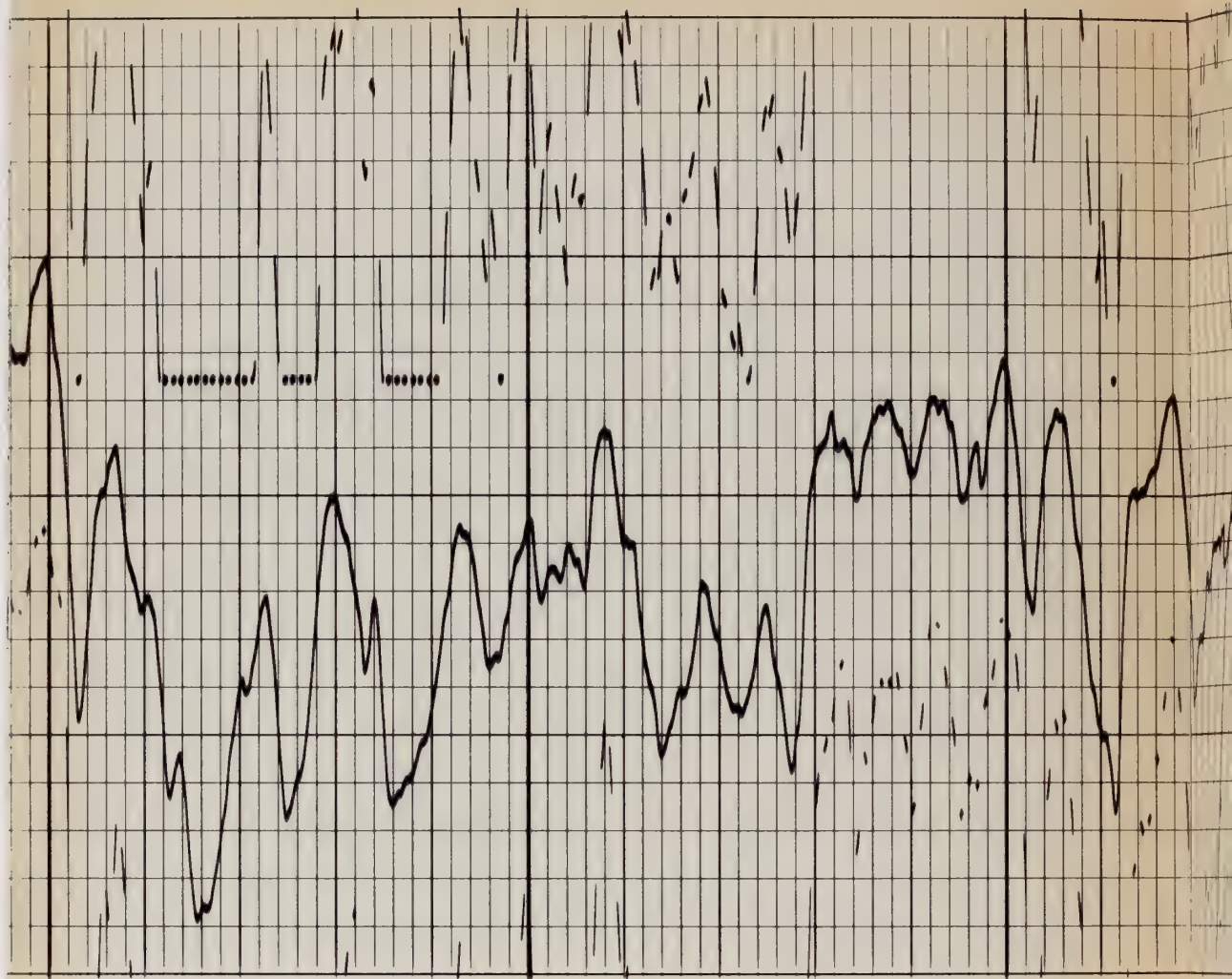
200



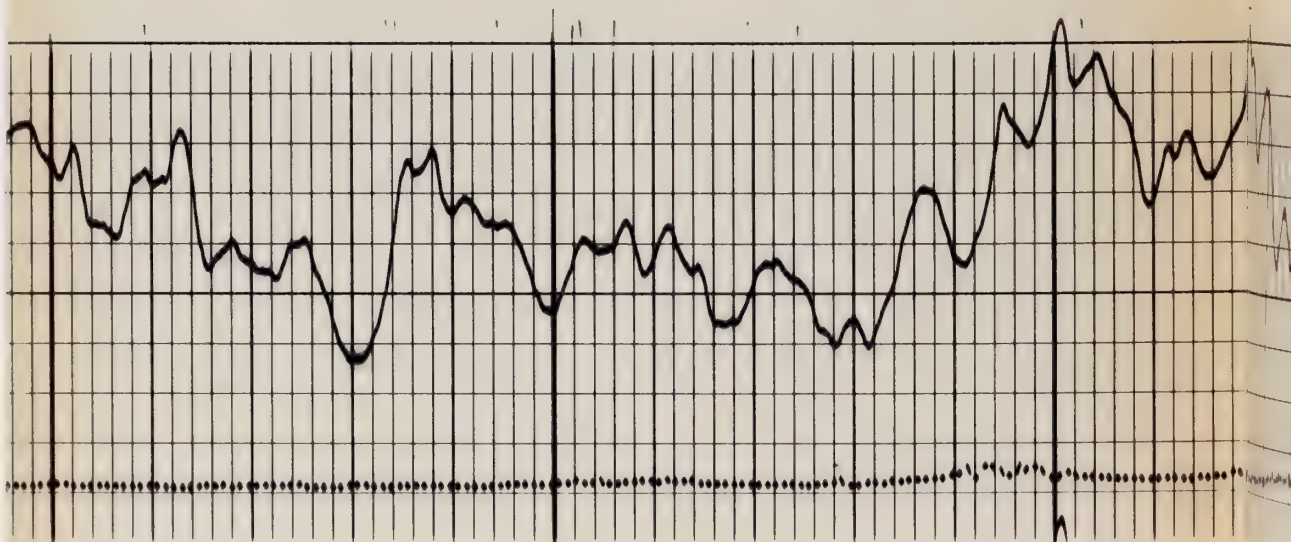


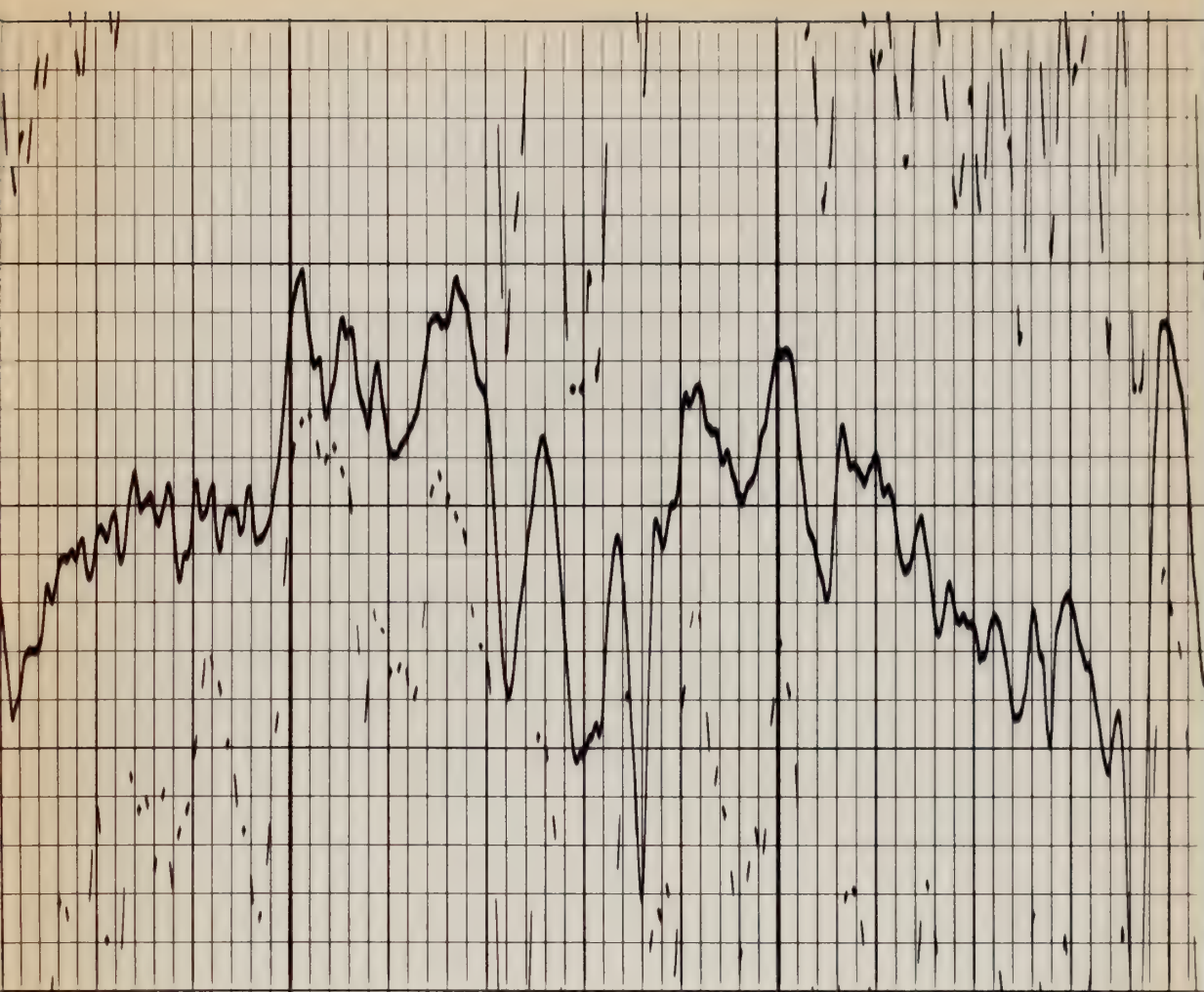
300



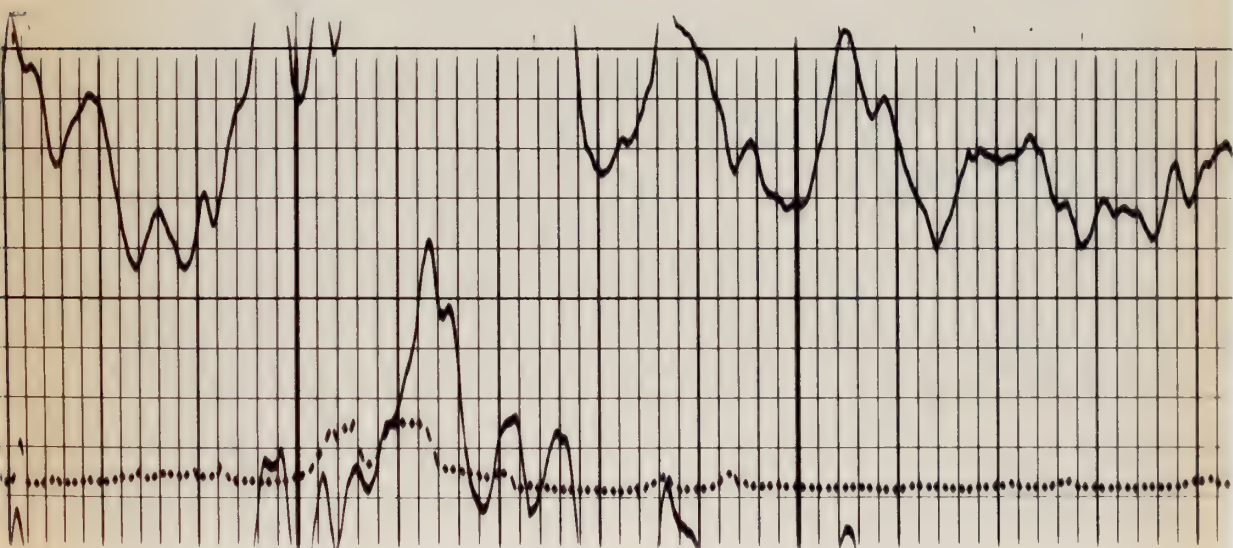


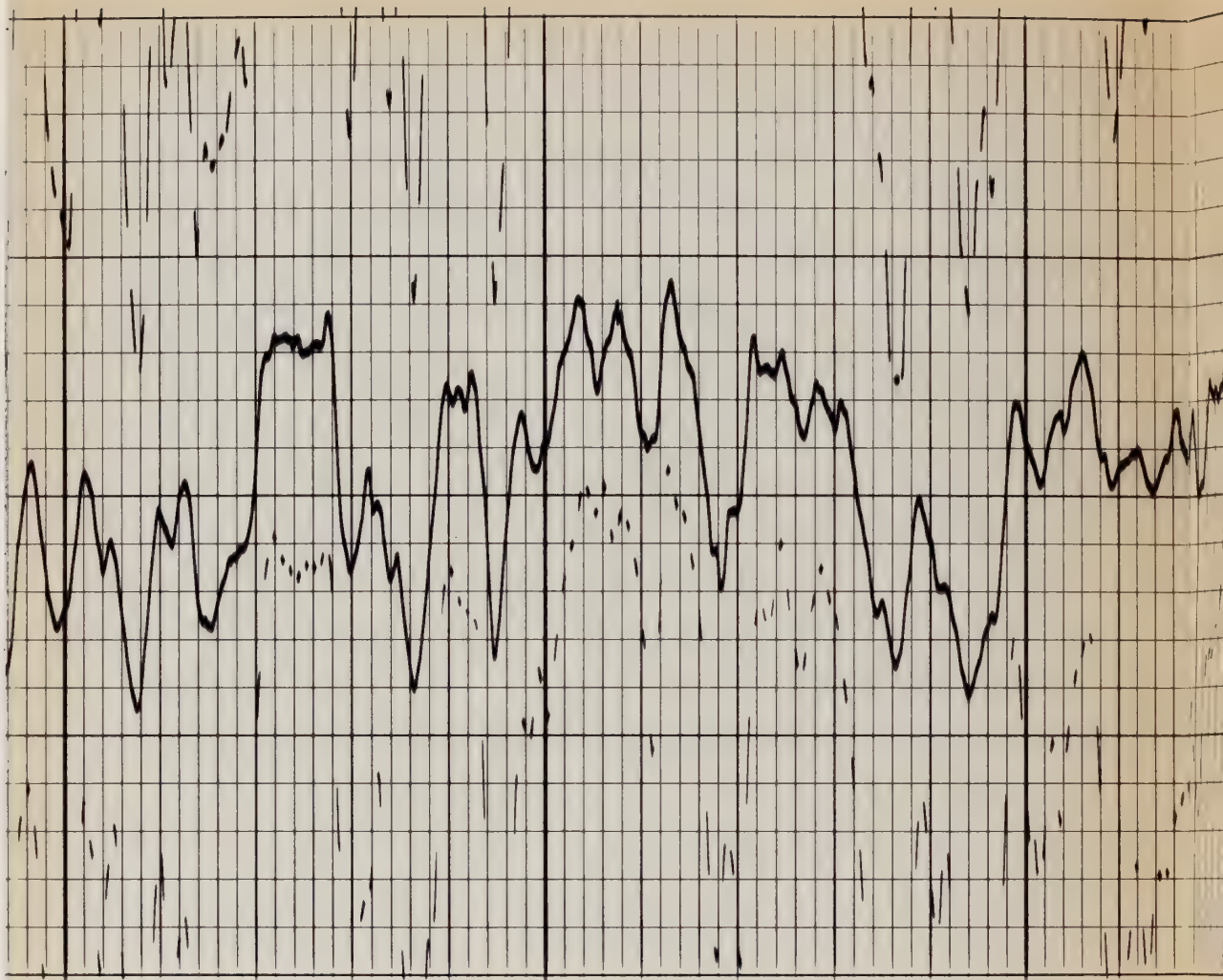
1000





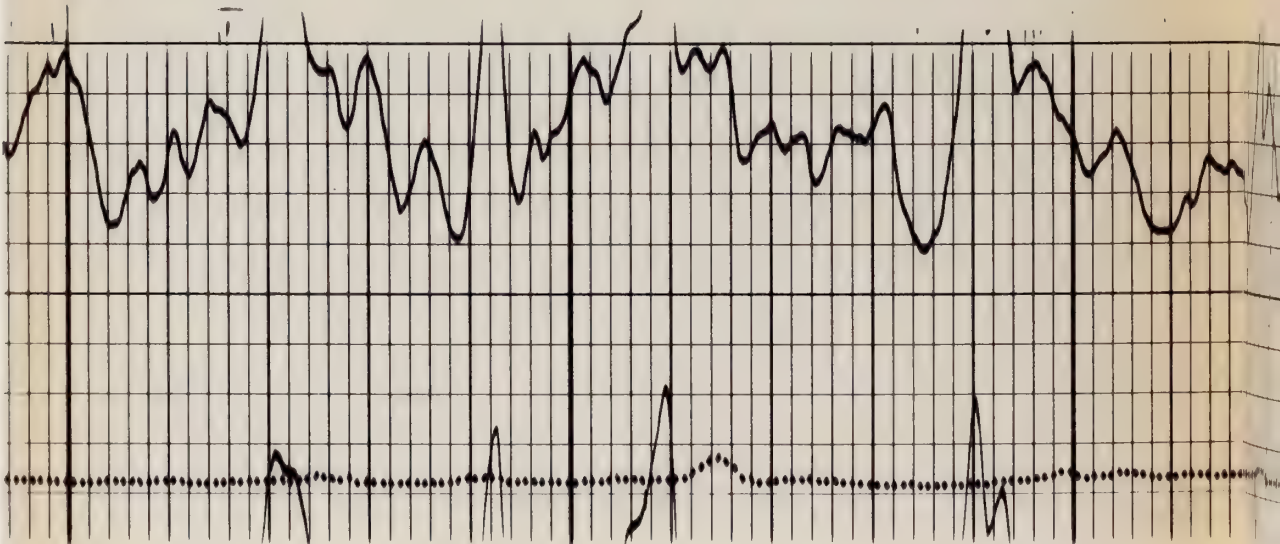
500

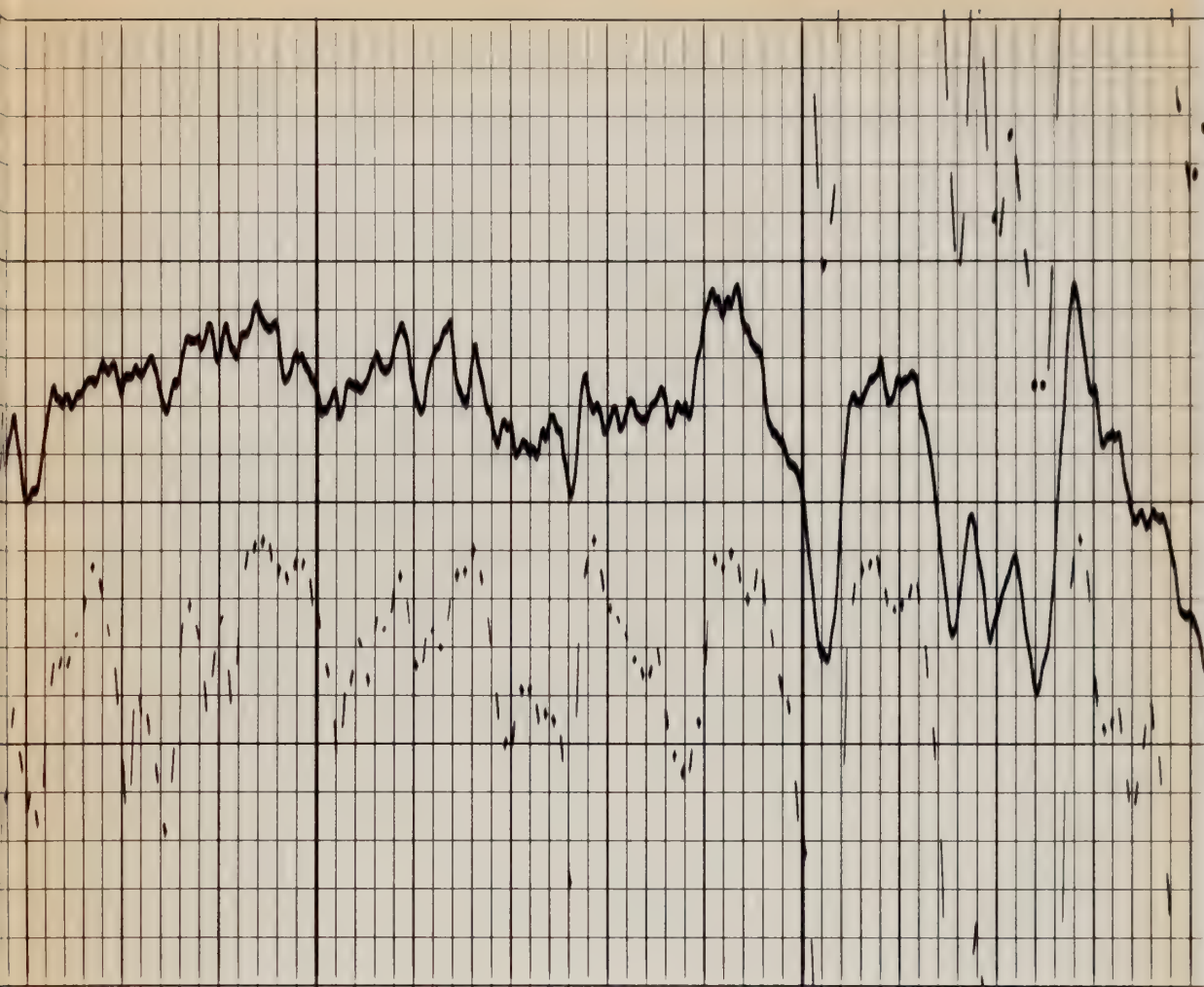




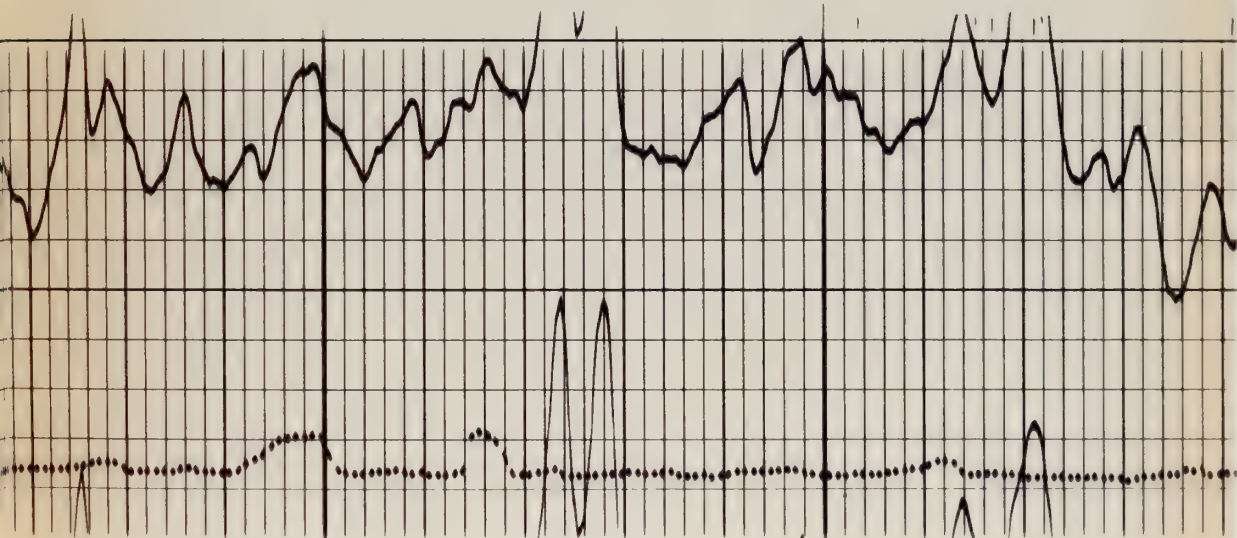
1500

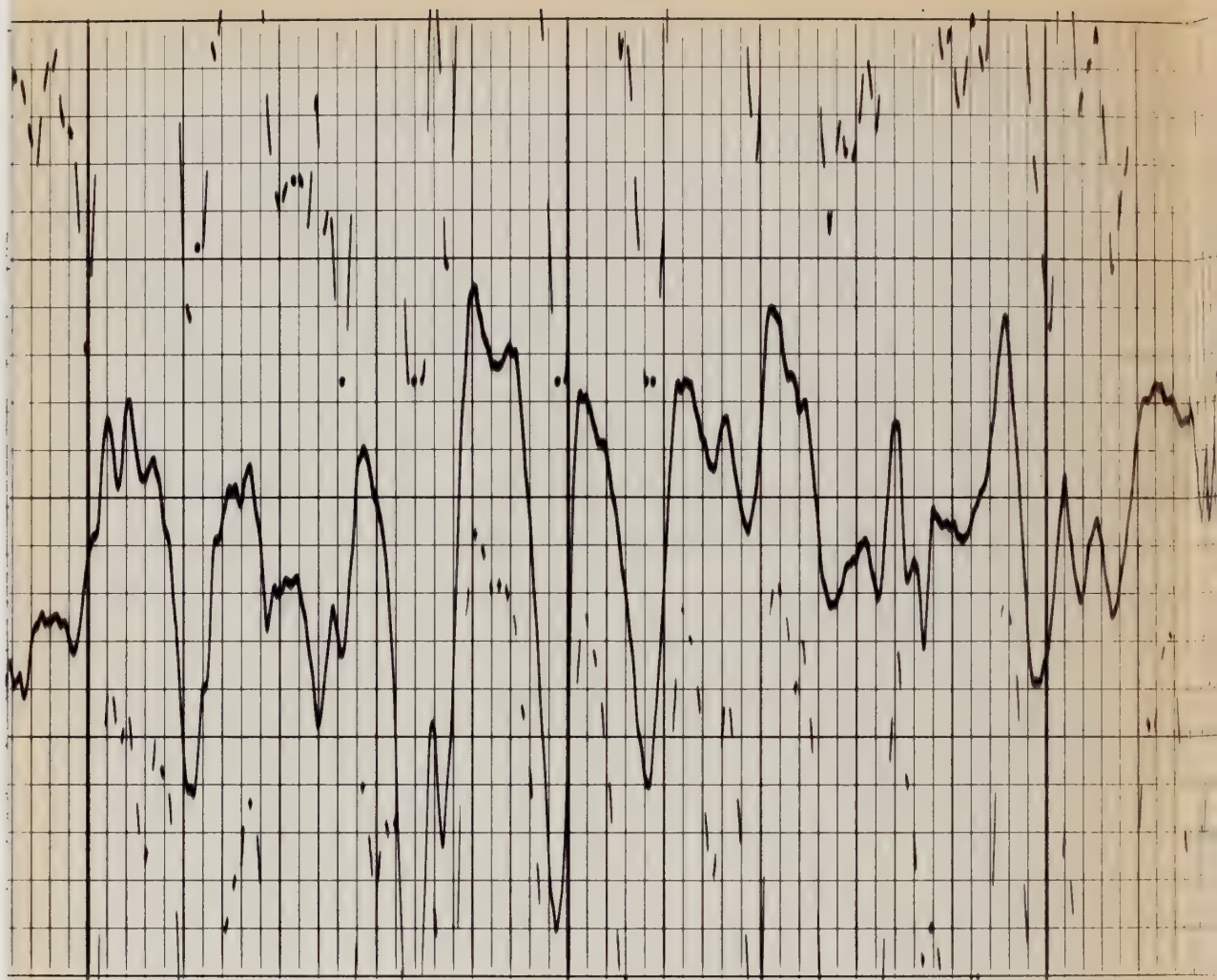
1700



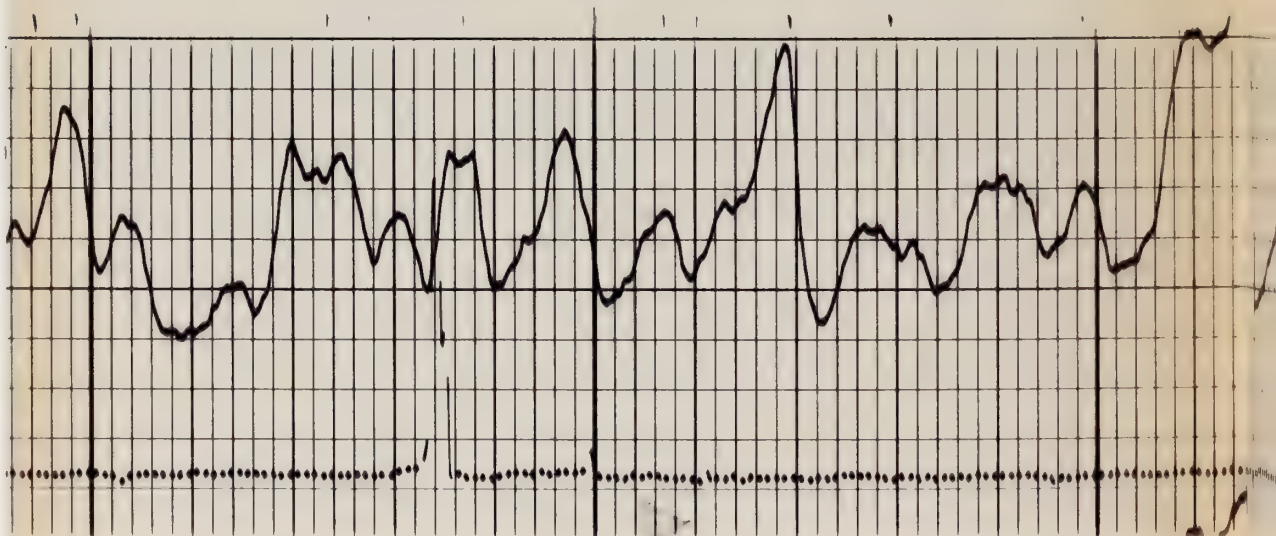


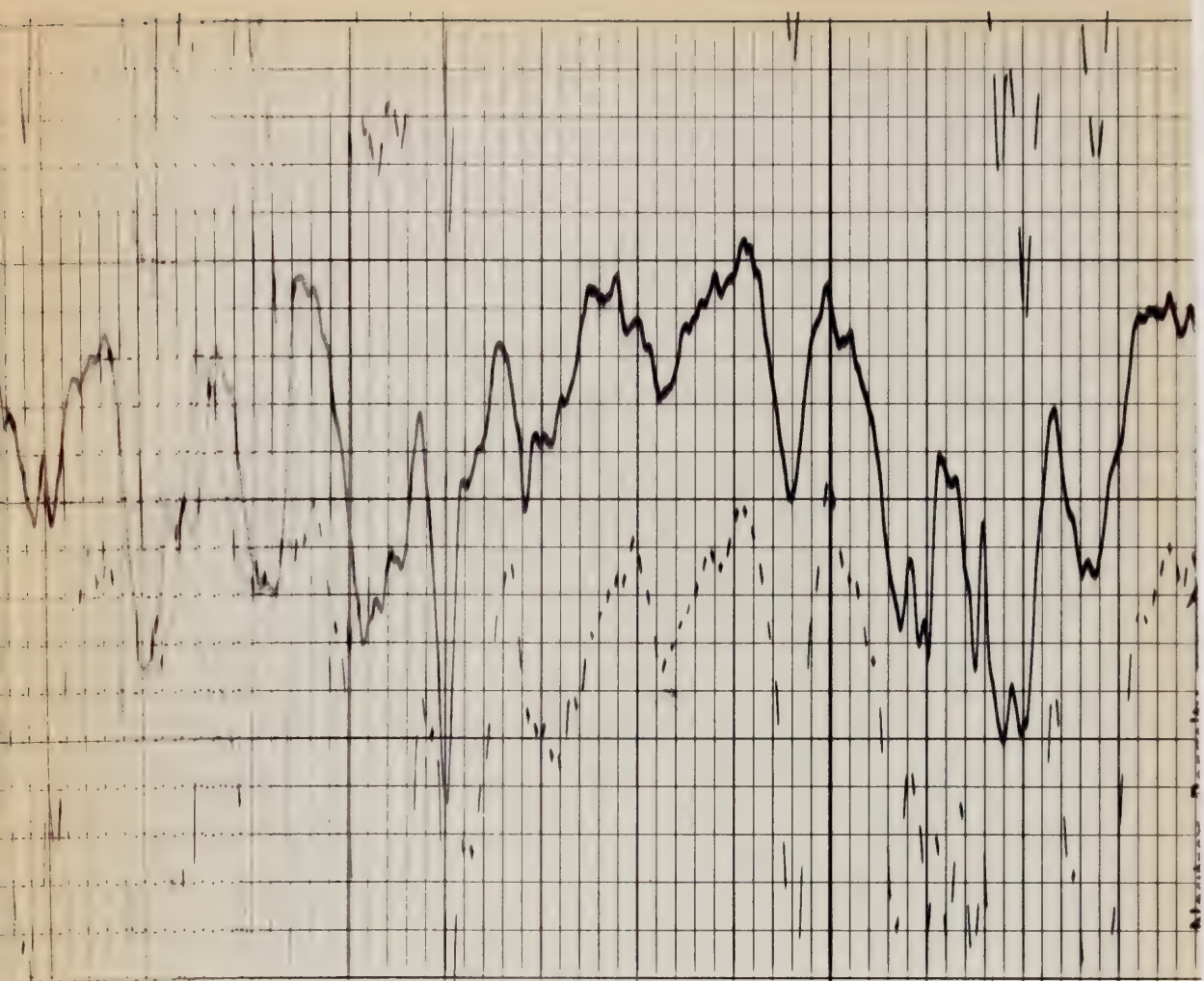
1800



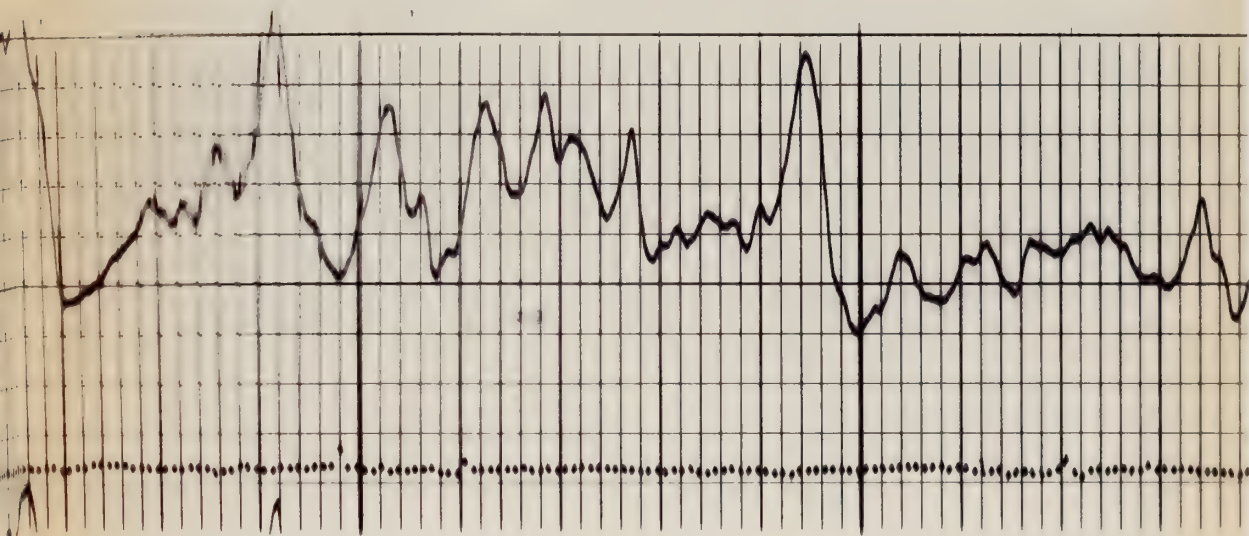


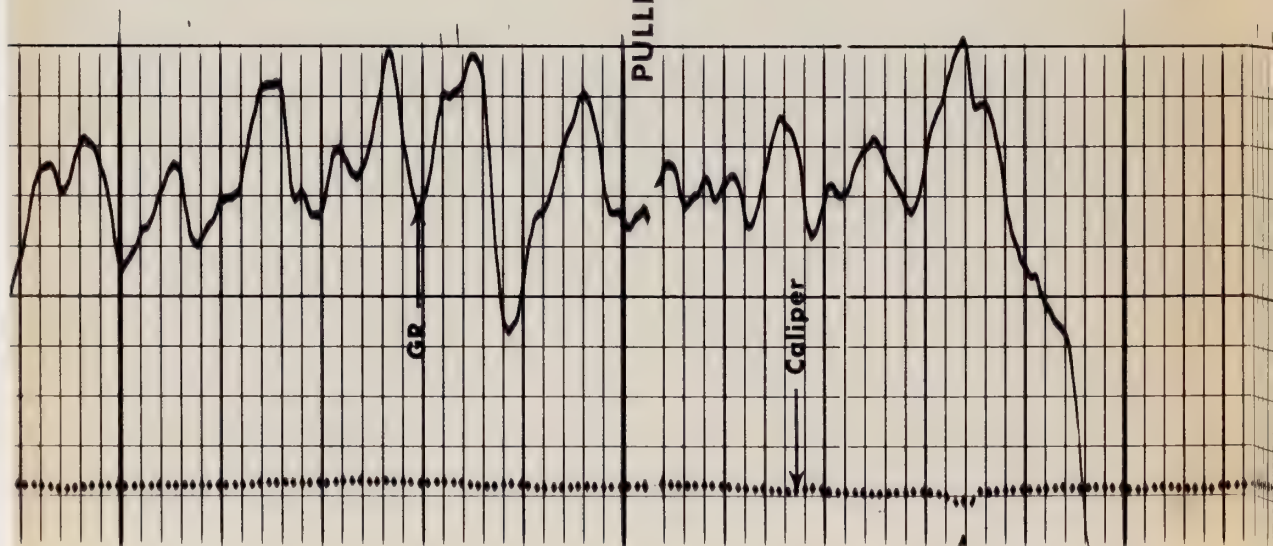
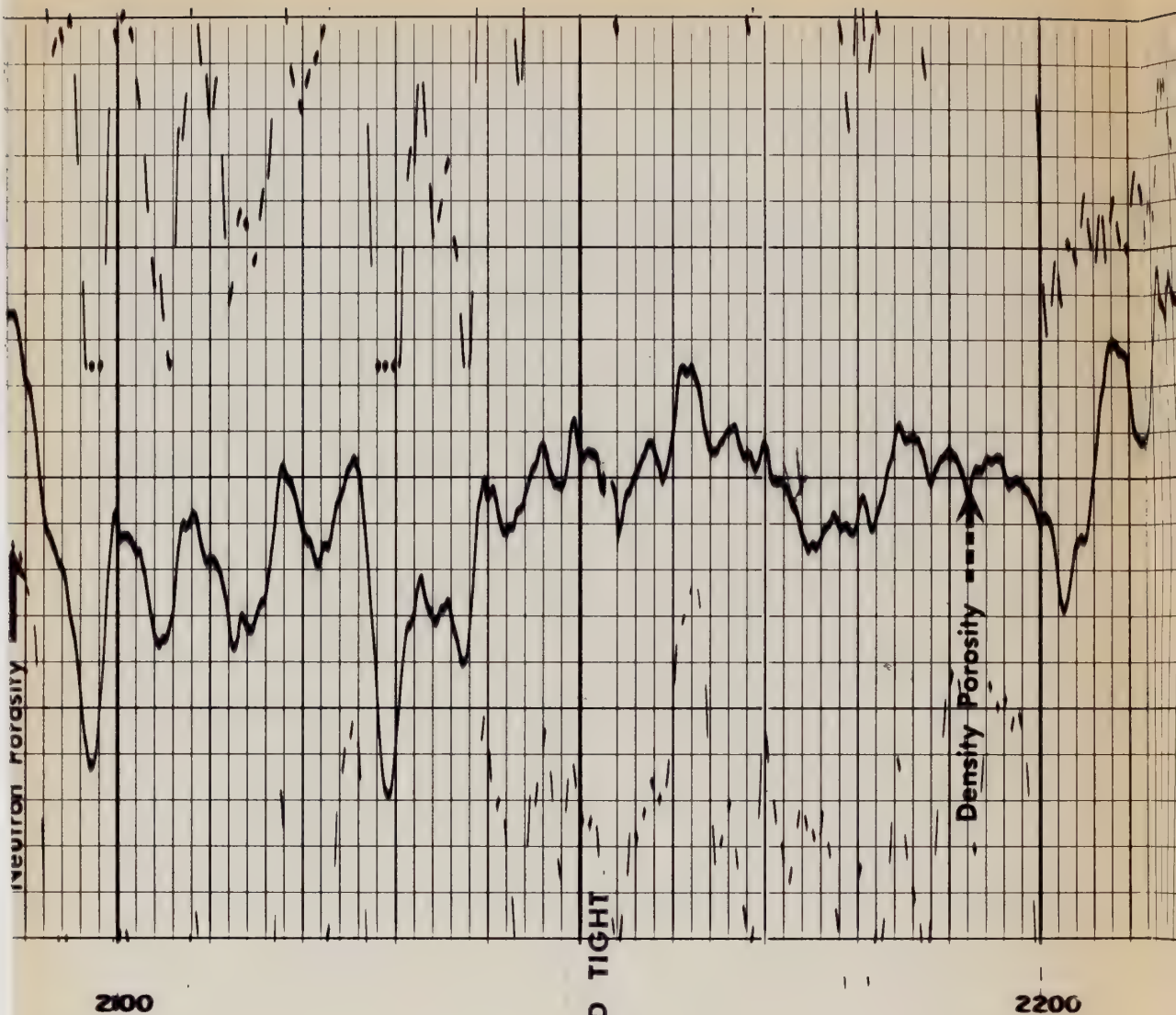
500

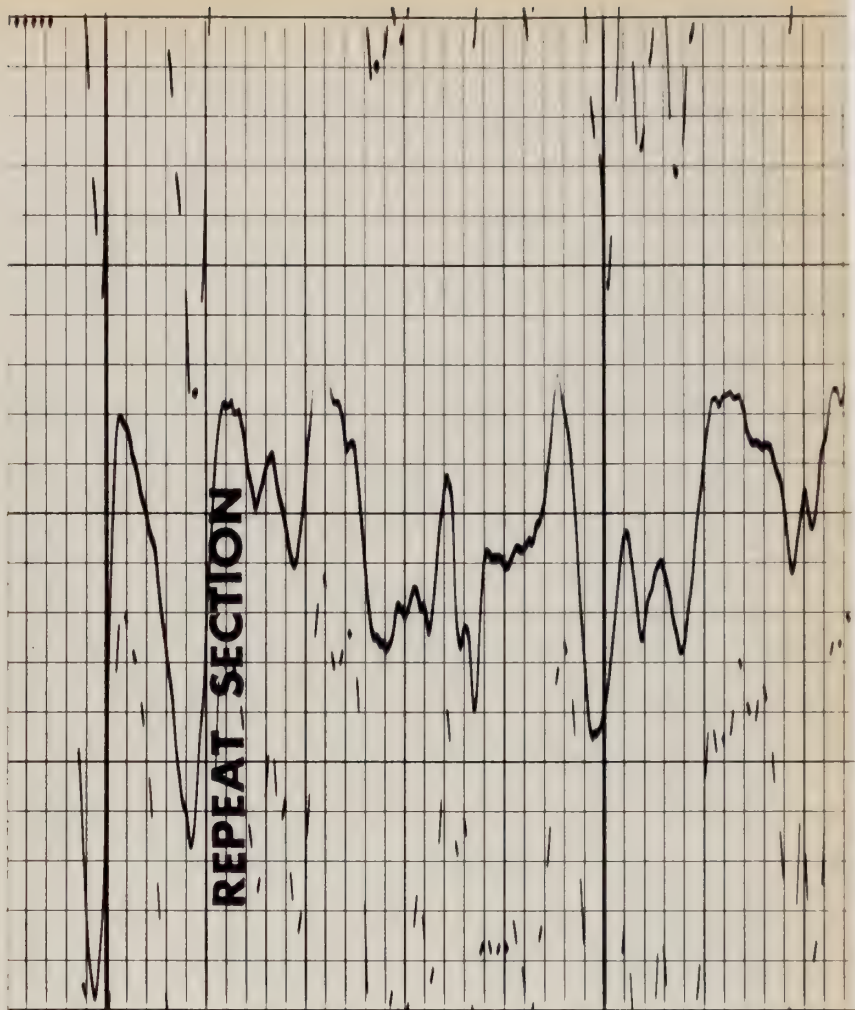




2006

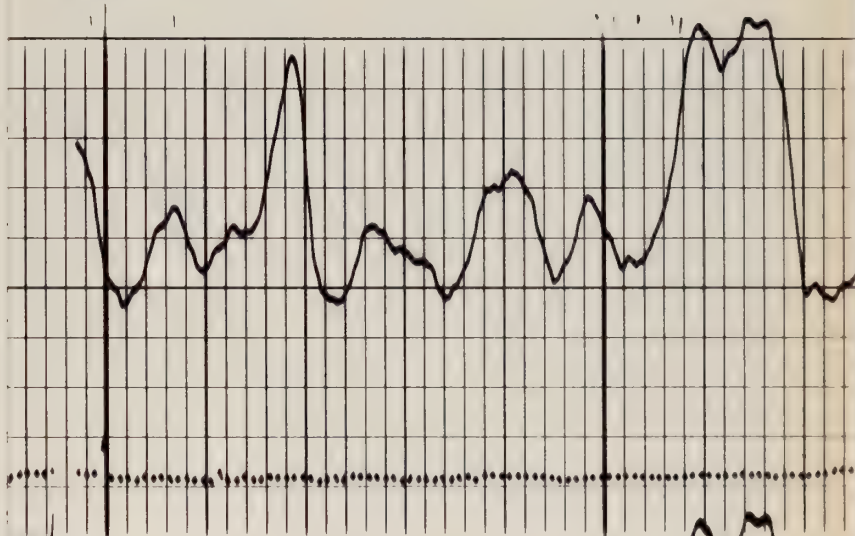
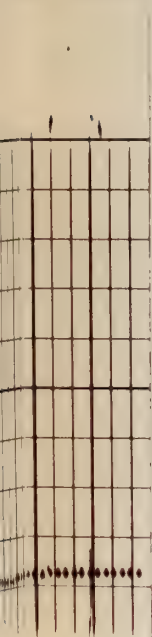


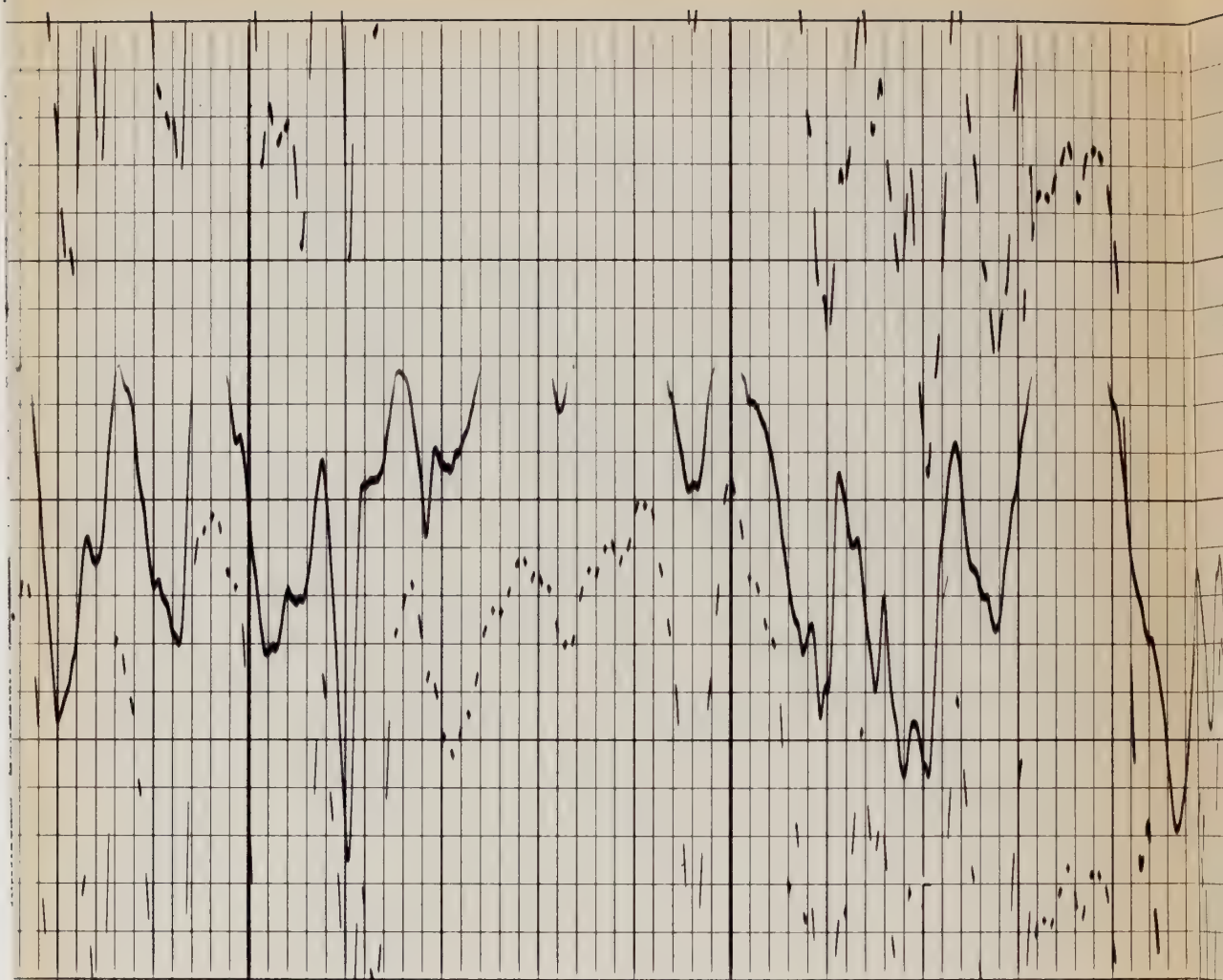




REPEAT SECTION

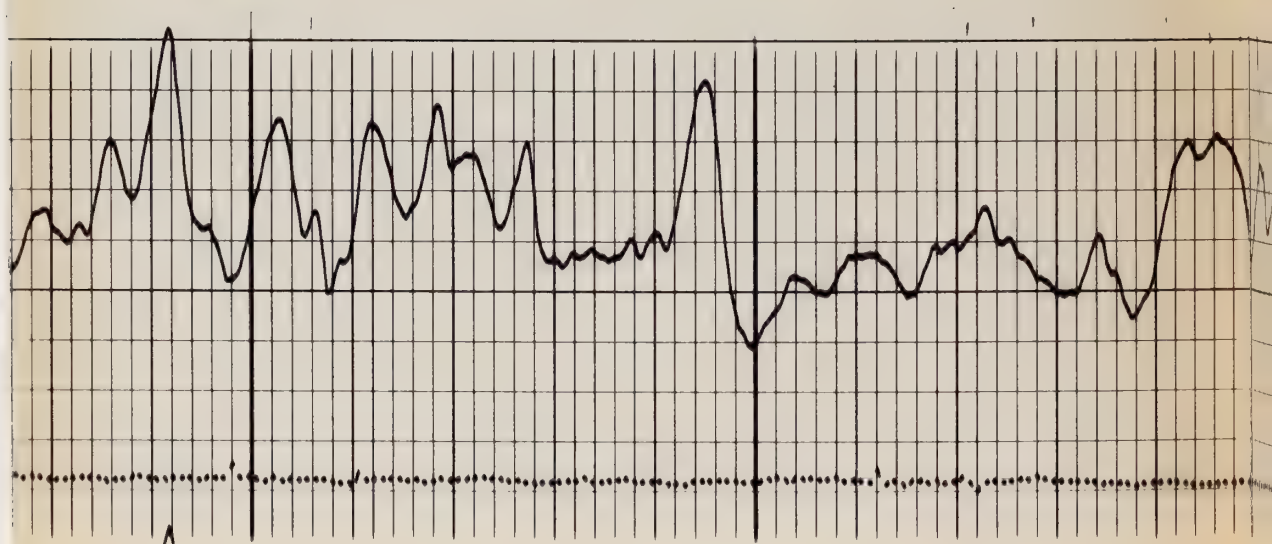
1500

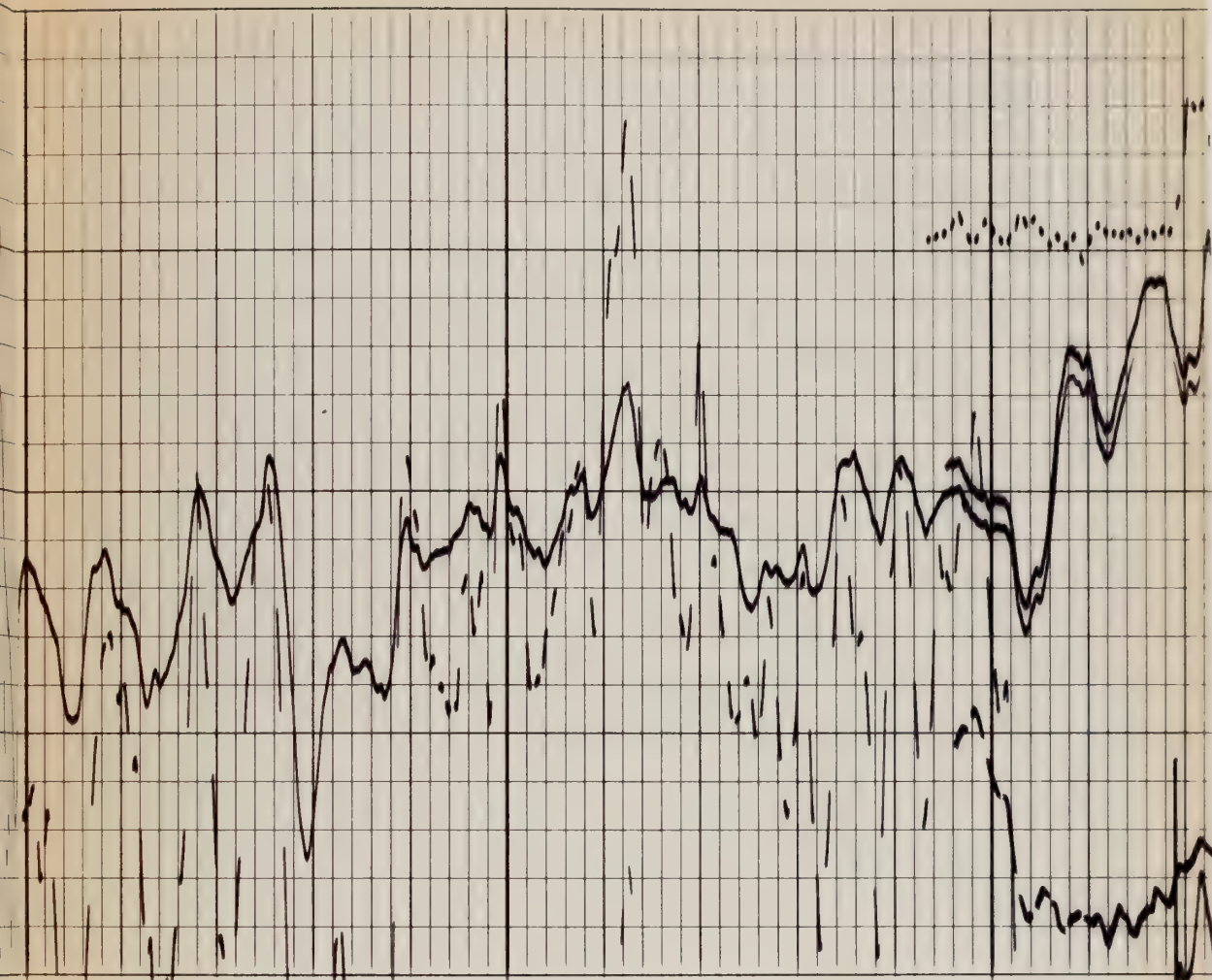




2000

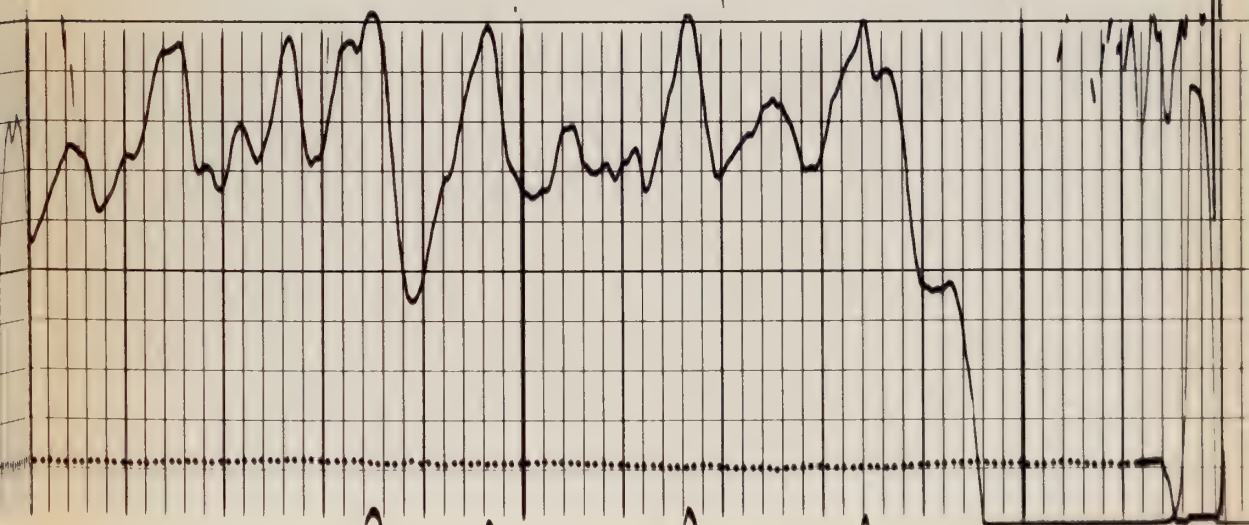
1200

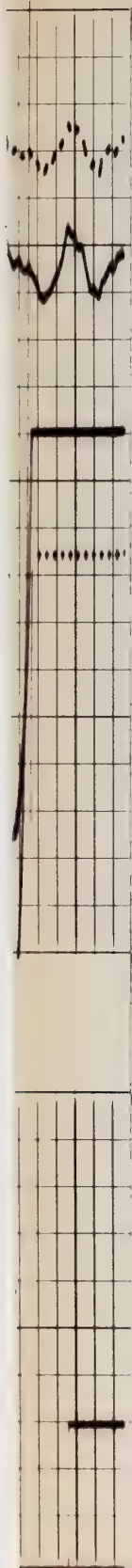




001

22001





DEPTHS	
GAMMA RAY API UNITS	
NEUTRON POROSITY INDEX % LIMESTONE MATRIX	
DENSITY POROSITY INDEX % LIMESTONE MATRIX	
CALIPER HOLE DIAM. IN INCHES	

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

SCHL. FR 2219

SCHL. TD 2220

DRLR TD 2220

Elev:

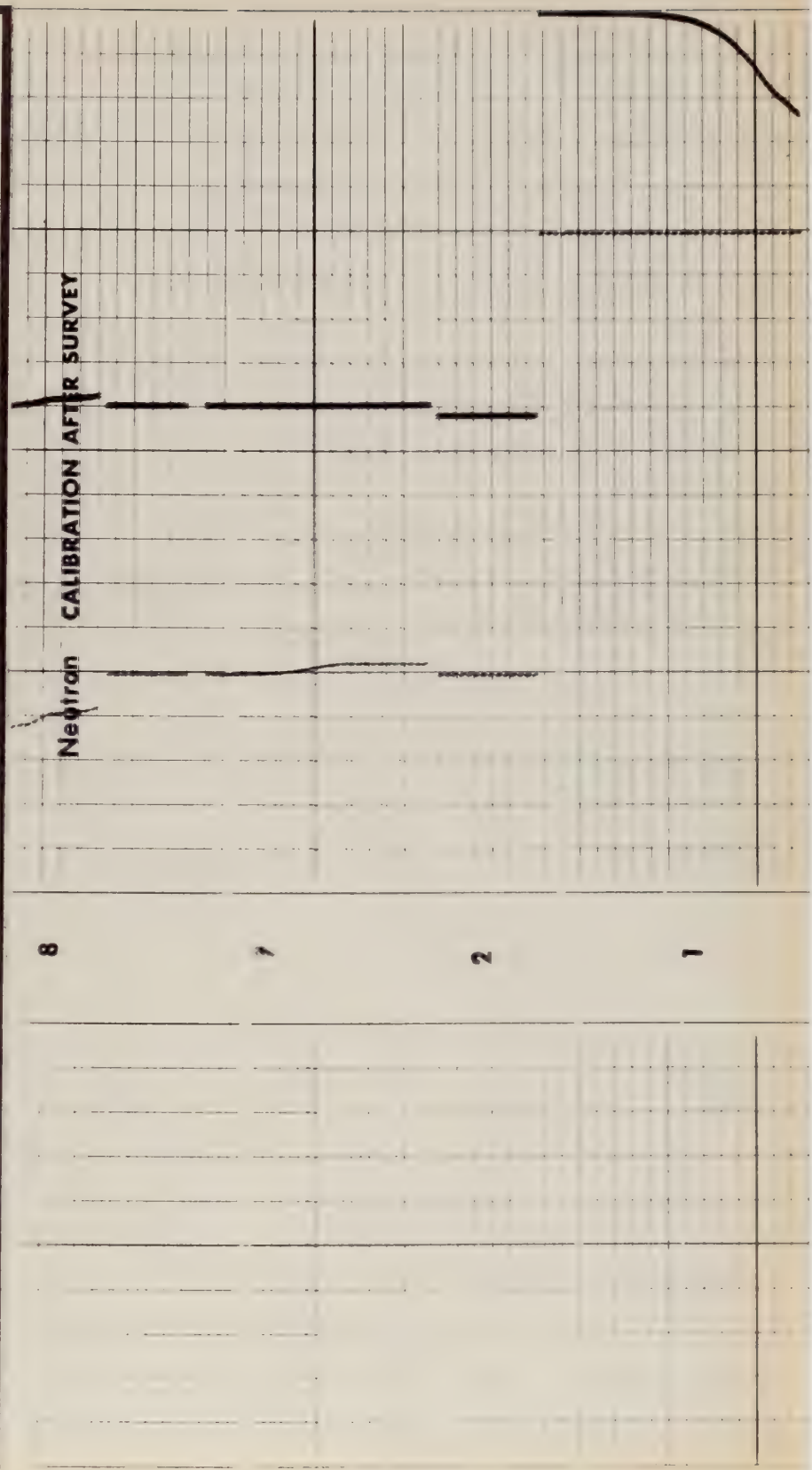
THIS SORGHUM GULCH

CO. 2220

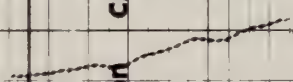
KB 2888

WELL SORGHUM GULCH #3
FIELD SORGHUM GULCH
COUNTY RIO BLANCO
STATE COLORADO
KB
DF
GL 6888

CALIBRATION RECORD



Neutron CALIBRATION BEFORE SURVEY



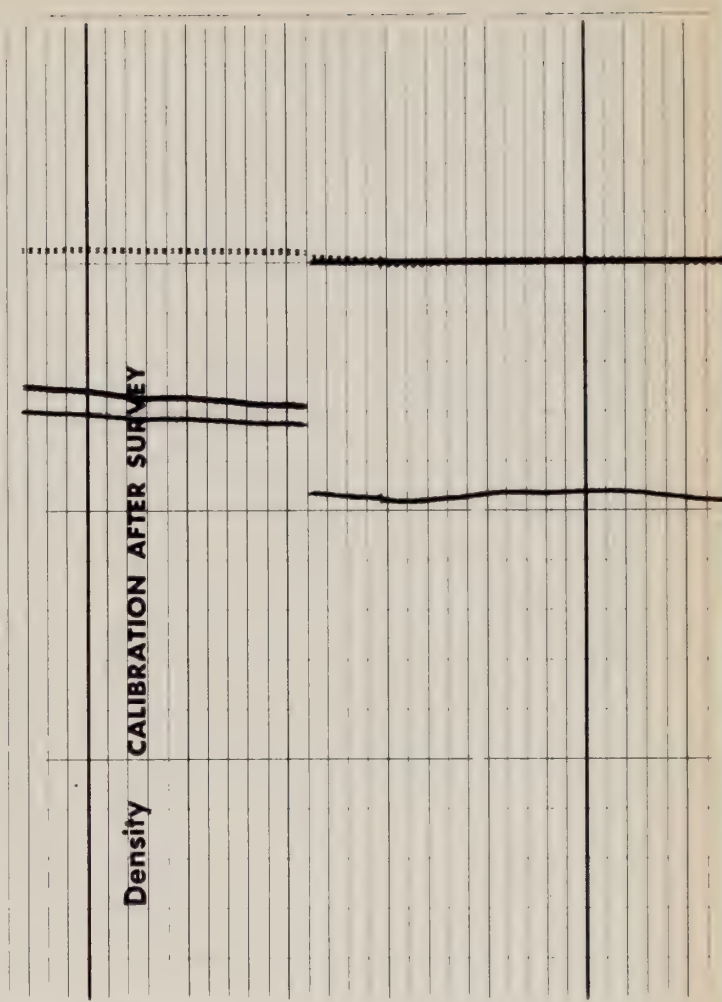
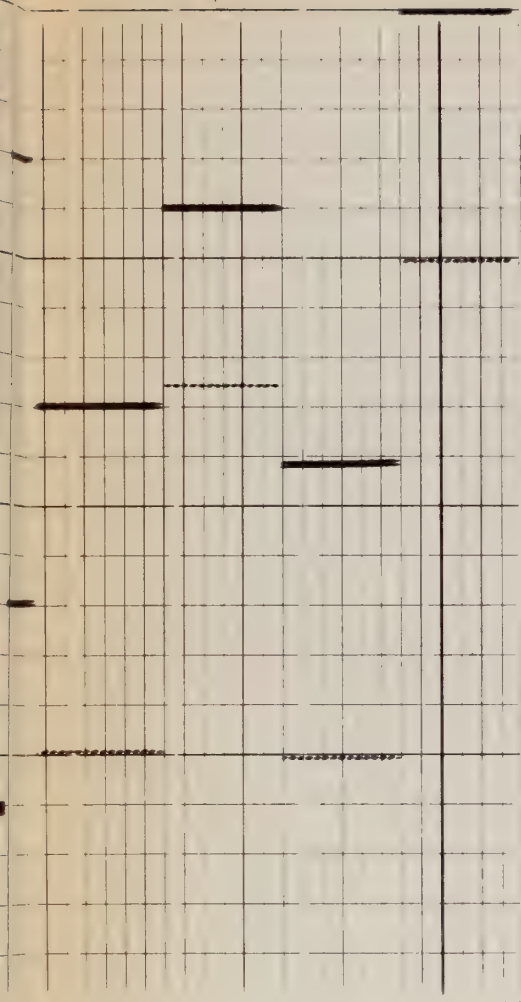
8

7

7

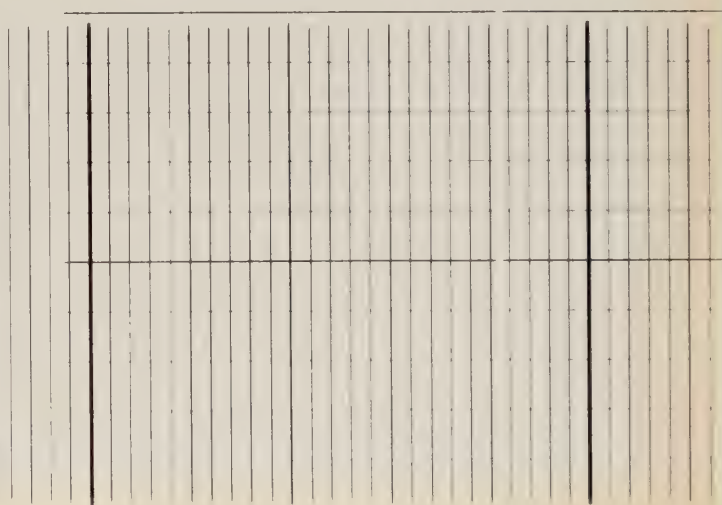
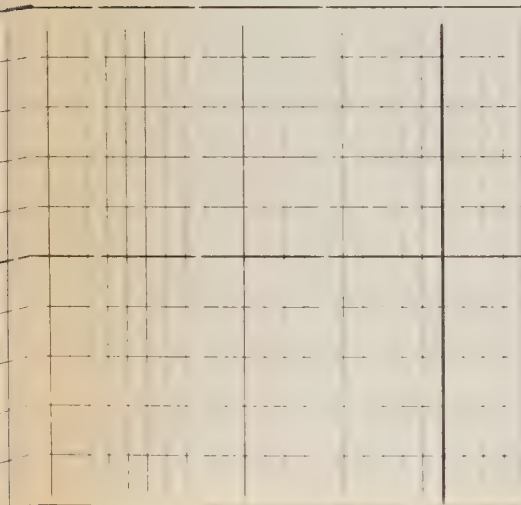
6

5



4
3
2
1

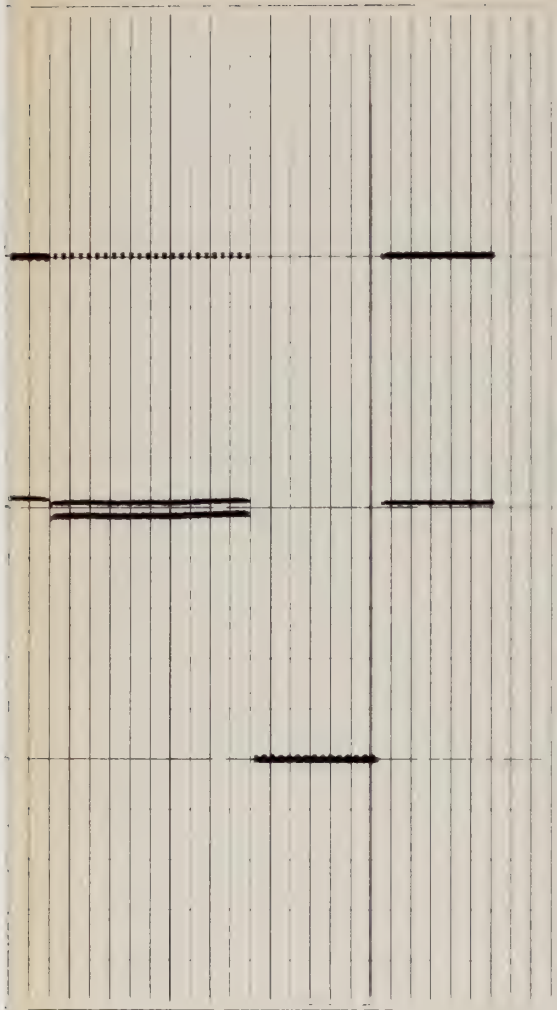
13
12



11

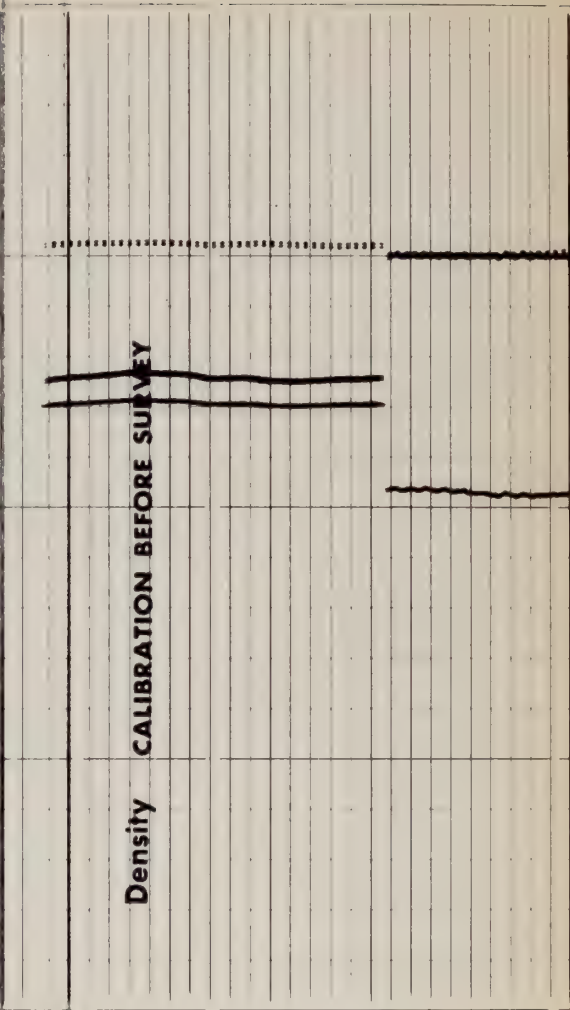
2

1

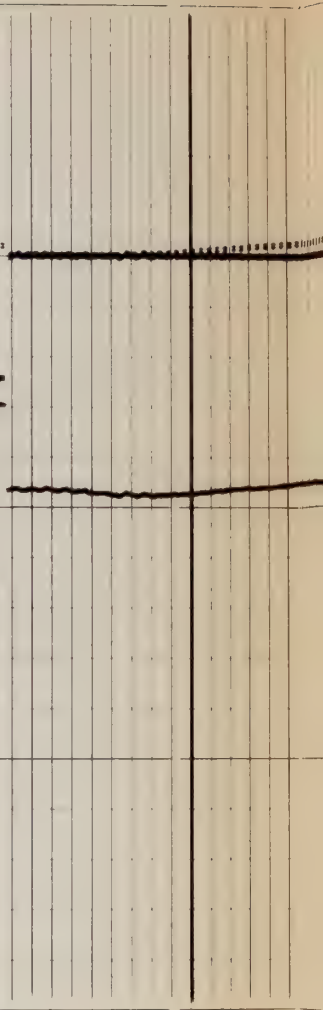


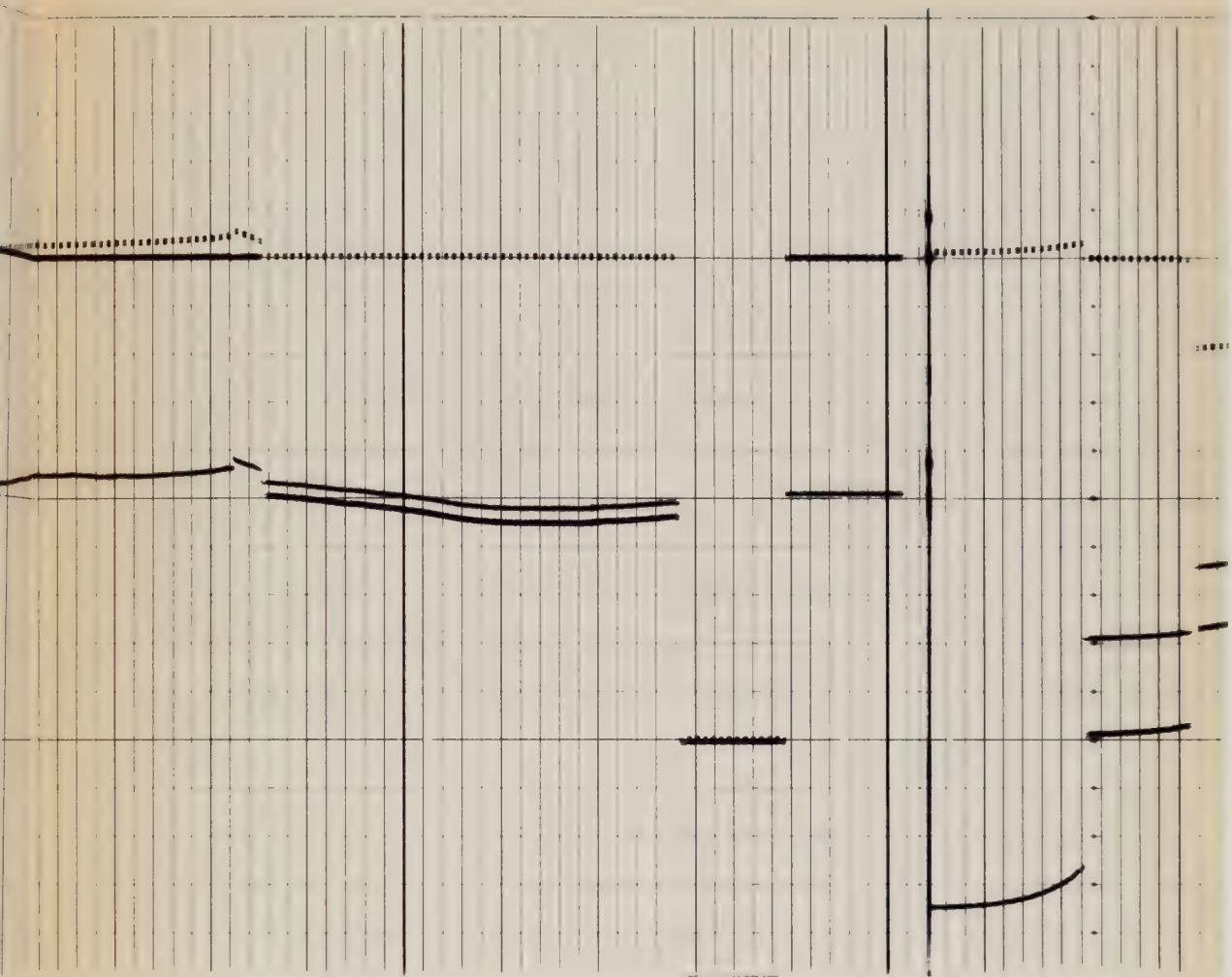
13

Density CALIBRATION BEFORE SURVEY



12





11

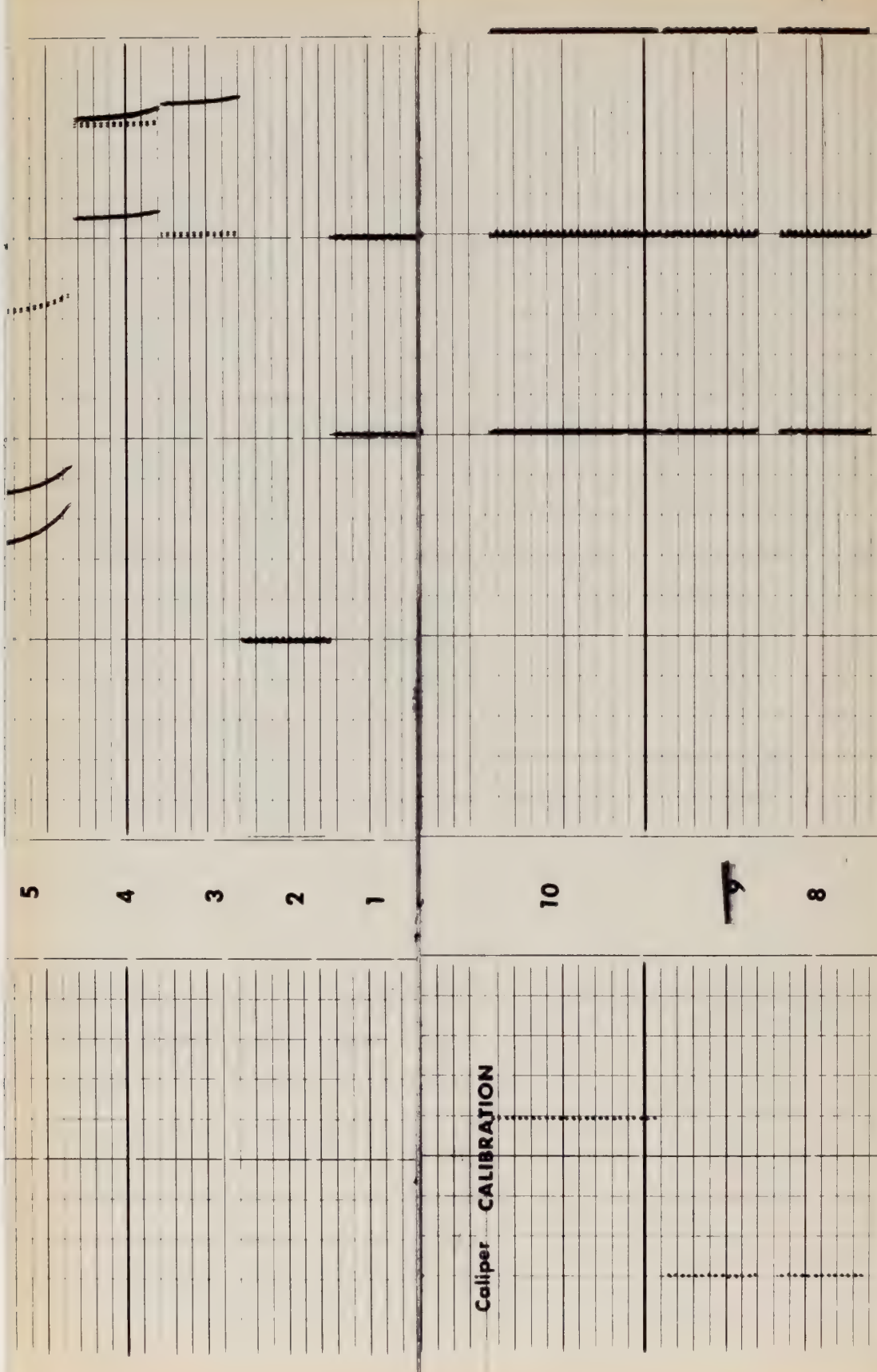
2

1

7

6

2



Caliper CALIBRATION



CALIBRATION RECORD

CALIBRATION RECORD

COMPANY THE ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH #6
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2219
SCHL. TD 2220
DRLR TD 2220
Elev: KB
DF
GL 6888

COLO
CO
BLANCO
RIO
COUNTY

Per
Log
Dri

Dat

Run

Dep

Dep

Btm

Top

Cas

Cas

Cas

Cas

Cas

Cas

Cas

Bit s

Type

De

Time

BHT

Equ

Reco

Schlumberger

TEMPERATURE LOG

COUNTY RIO BLANCO, COLO.
 FIELD or LOCATION SORGHUM GULCH
 WELL SORGHUM GULCH #6
 COMPANY ATLANTIC RICHFIELD

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION

2523' FSL & 2251' FW

Sec. 7 Twp. 3S Rge. 96W

Other Services:

DIL
FDC-CNL-GR
BHC-GR

Permanent Datum: GL; Elev.: 6888
 Log Measured From GL, 0 Ft. Above Perm. Datum
 Drilling Measured From GL

Elev.: K.B. _____
 D.F. _____
 G.L. 6888

Date	<u>8/22/74</u>		
Run No.	<u>ONE</u>		
Depth-Driller	<u>2220</u>		
Depth-Logger	<u>2220</u>		
Btm. Log Interval	<u>2220</u>		
Top Log Interval	<u>456</u>		
Casing-Driller	<u>8-5/8</u>	<u>@ 59</u>	<u>@</u>
Casing-Logger			
Casing Size	<u>1</u>	To	To
	<u>2</u>	To	To
Casing Weight	<u>1</u>		
	<u>2</u>		
Casing Thickness	<u>1</u>		
	<u>2</u>		
Bit Size	<u>1</u>	To	To
	<u>2</u>	To	To
Type Fluid in Hole	<u>WATER</u>		
Dens.	Visc.		
Time Since Circ.	<u>10 HOURS & 15 MIN</u>		
BHT	<u>104</u>		
Equip.	Location		
<u>5602</u>	<u>GJ</u>		
Recorded By	<u>BARGHOUTI</u>		
Used By	<u>ELLARD: TAIT</u>		

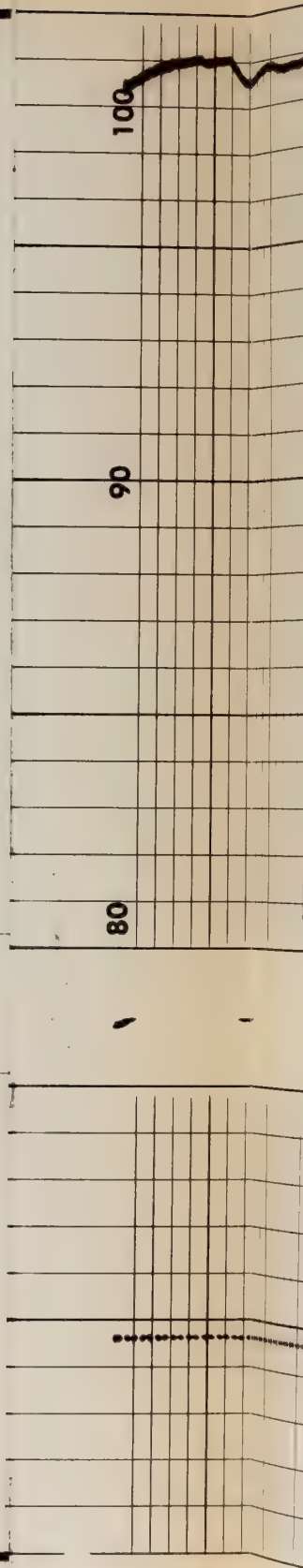
The well name, location and borehole reference data were furnished by the customer.

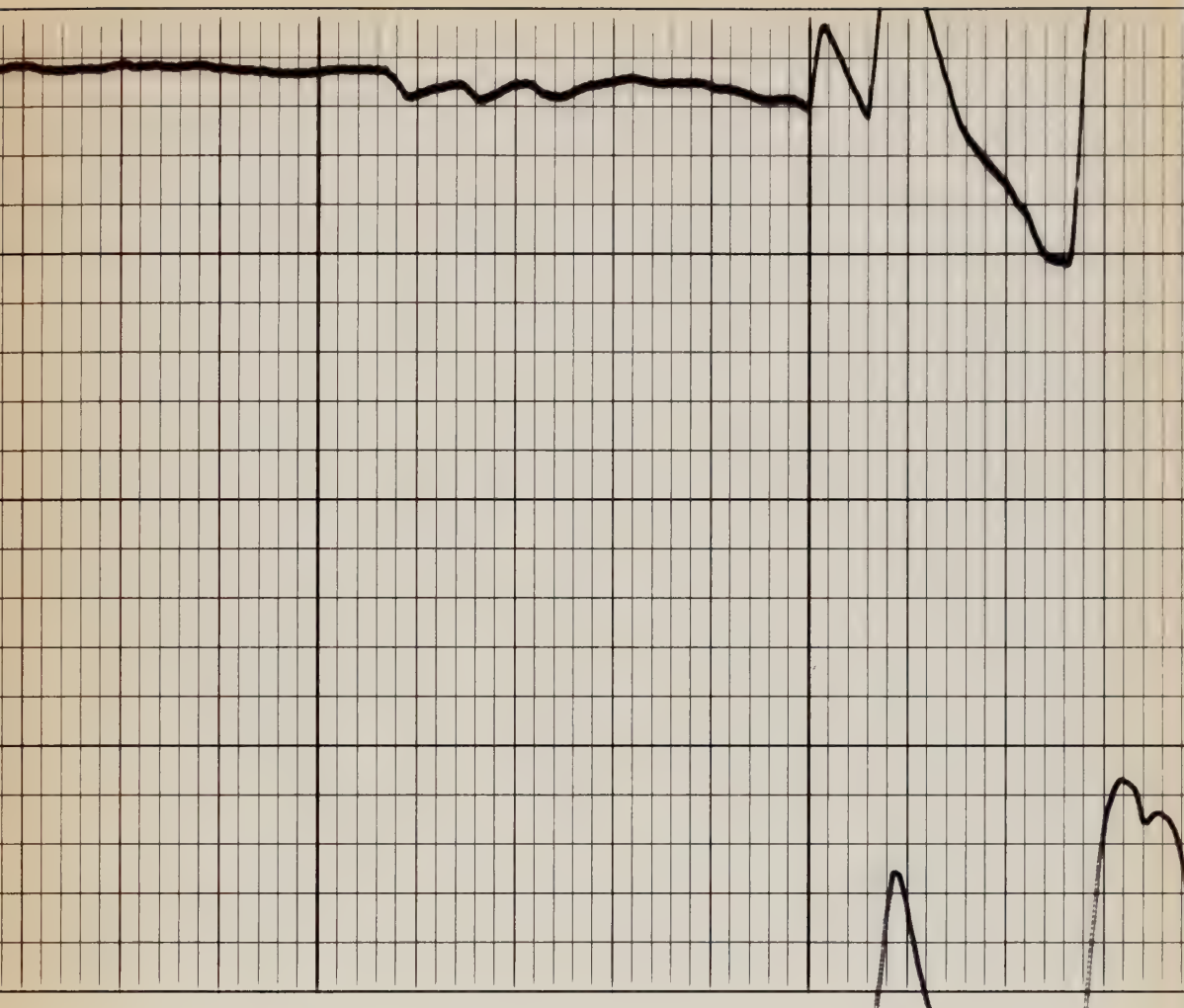
SUNNY @ 1615 ON 8/22/74 10-1/4 HOURS SINCE CIRCULATION

[illegible]

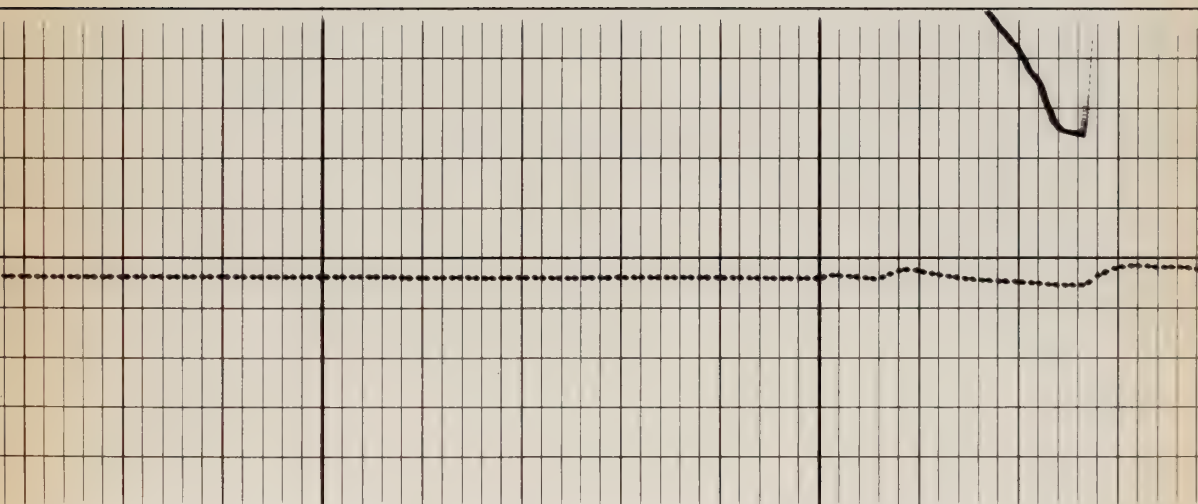
REDUCED SENSITIVITY TEMPERATURE

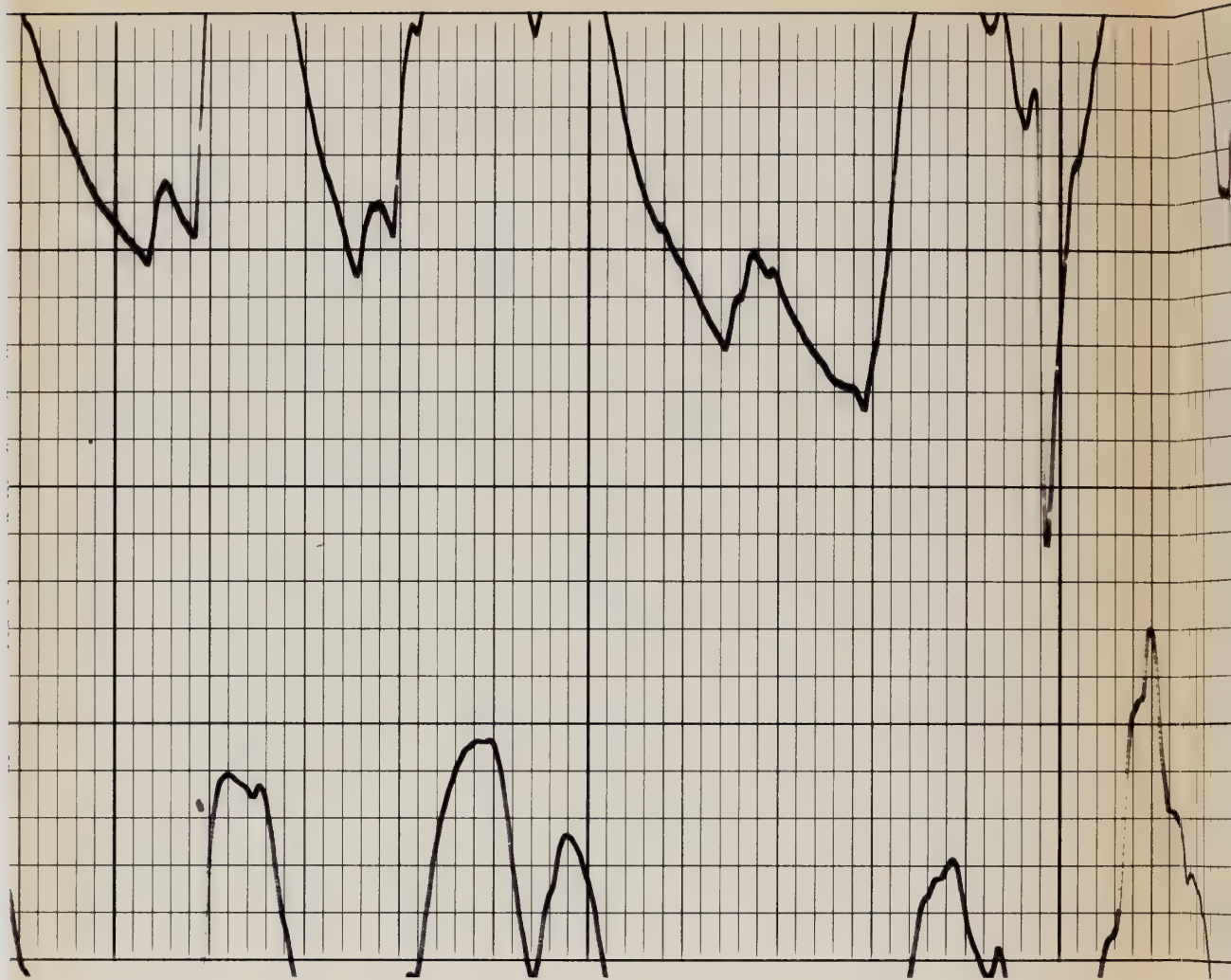
TEMPERATURE ° F.





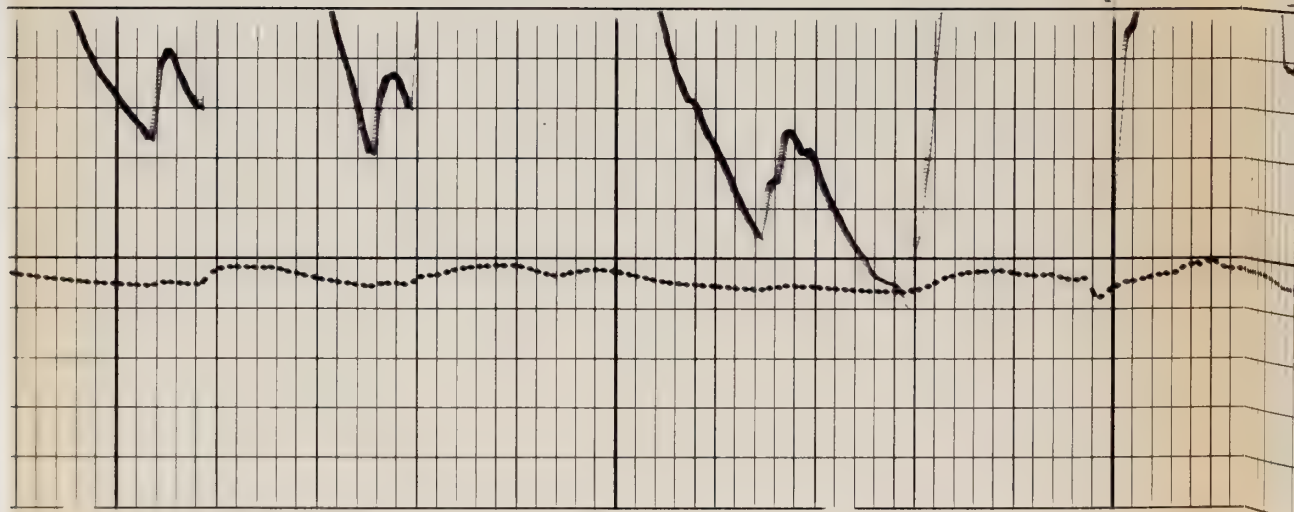
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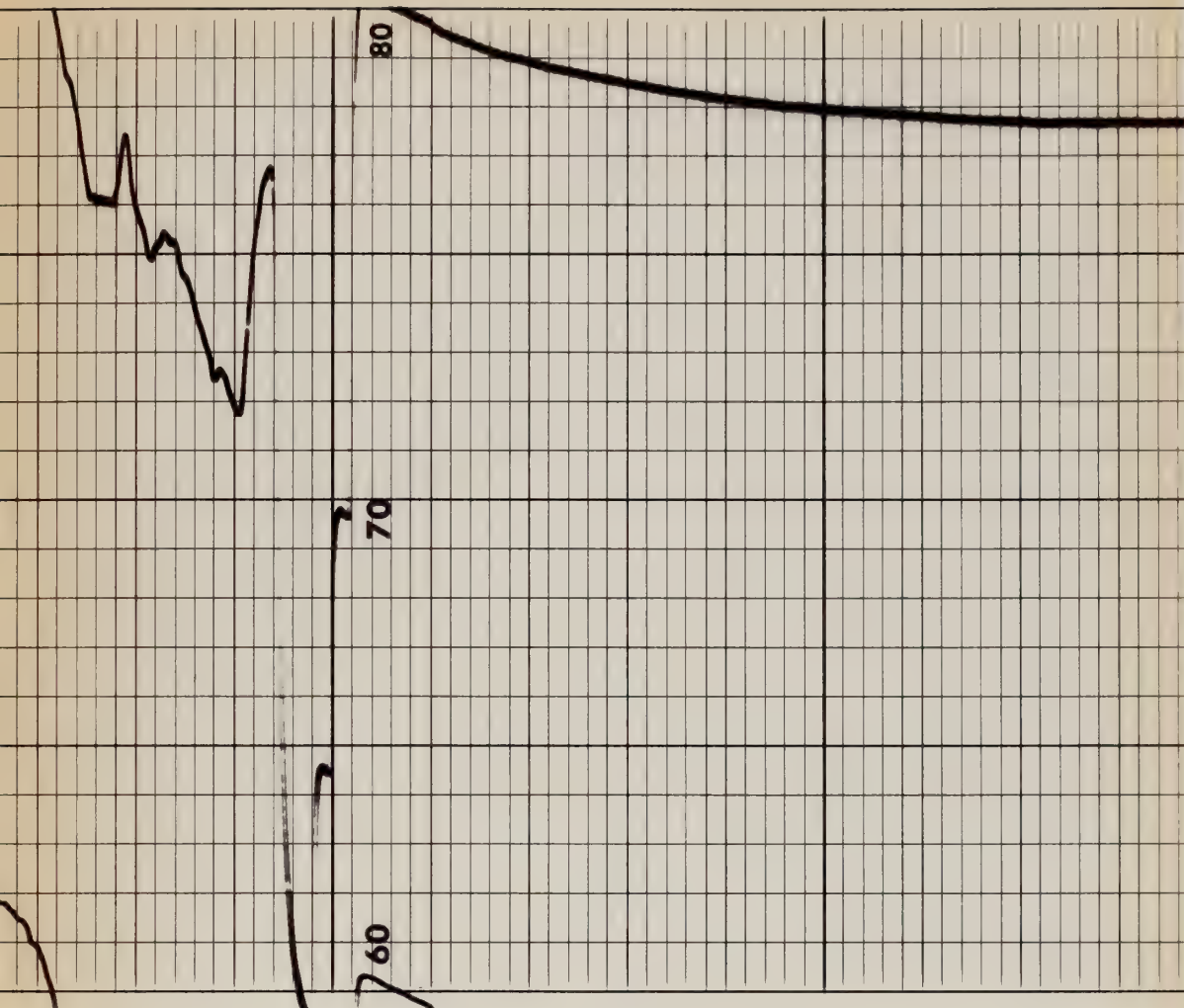




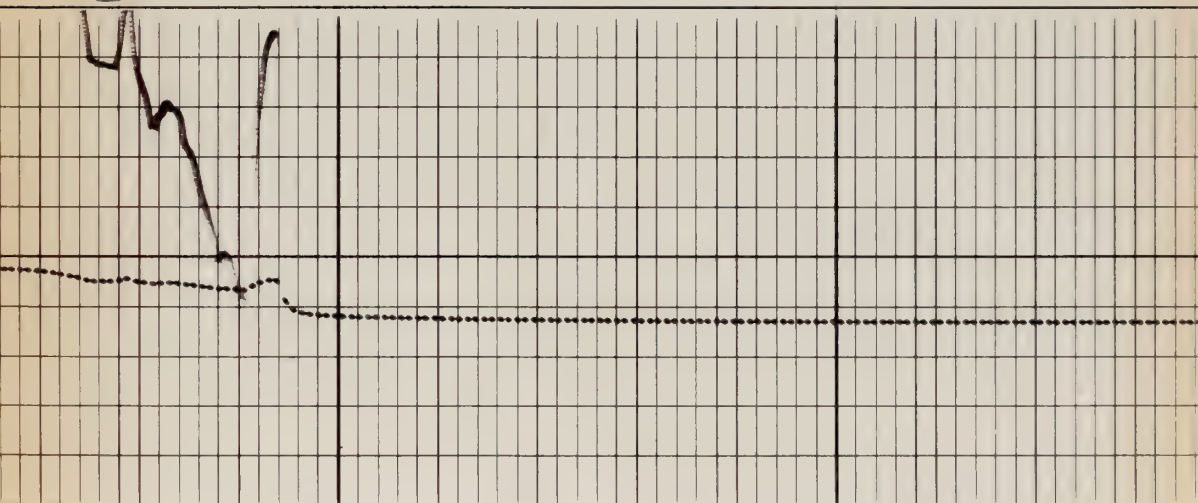
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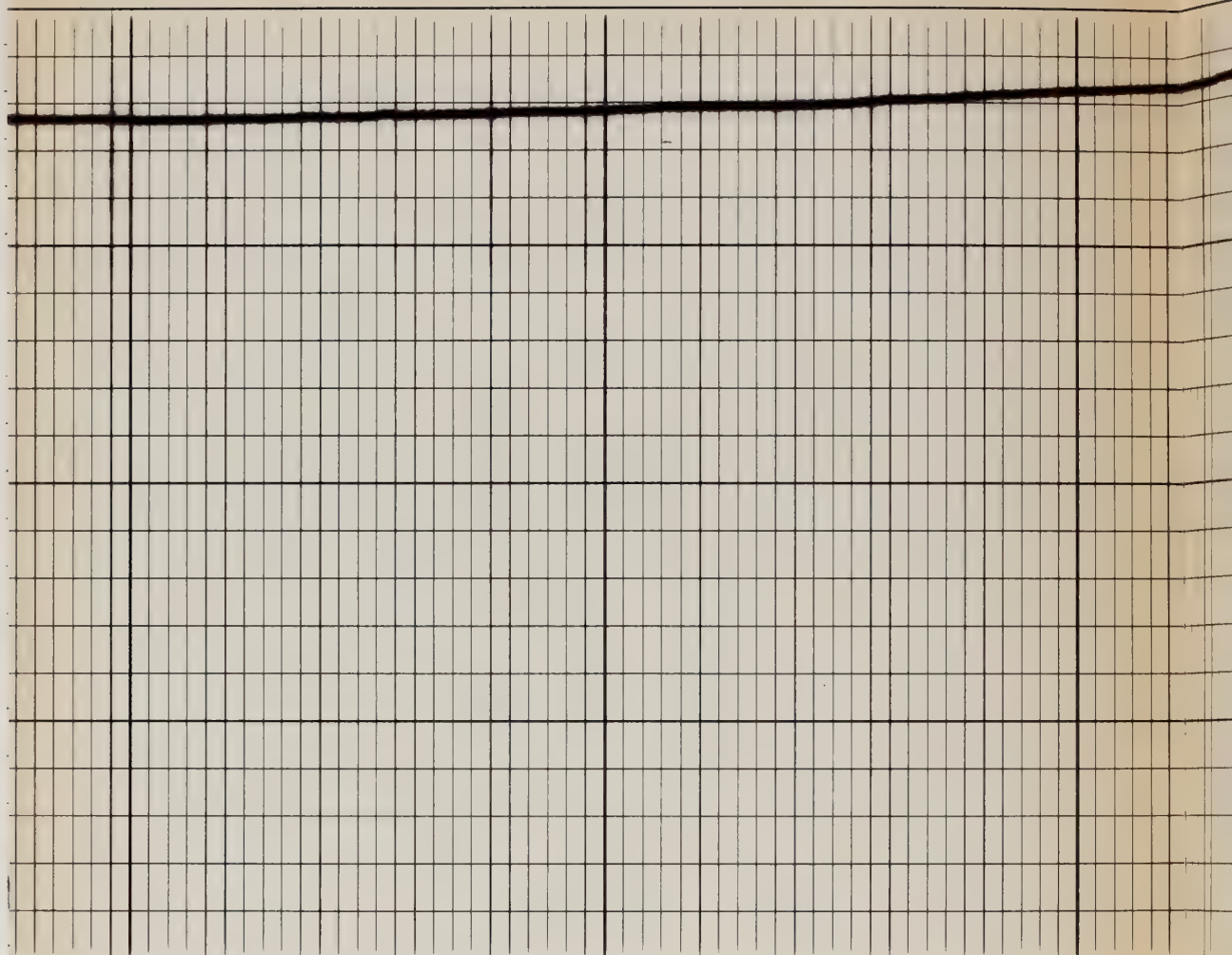
400



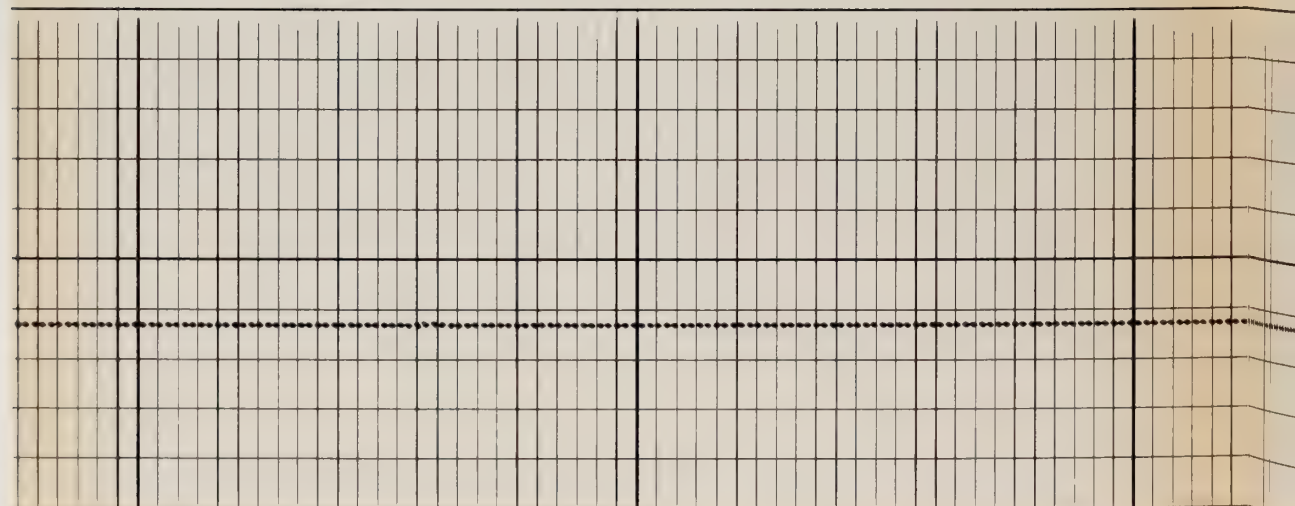


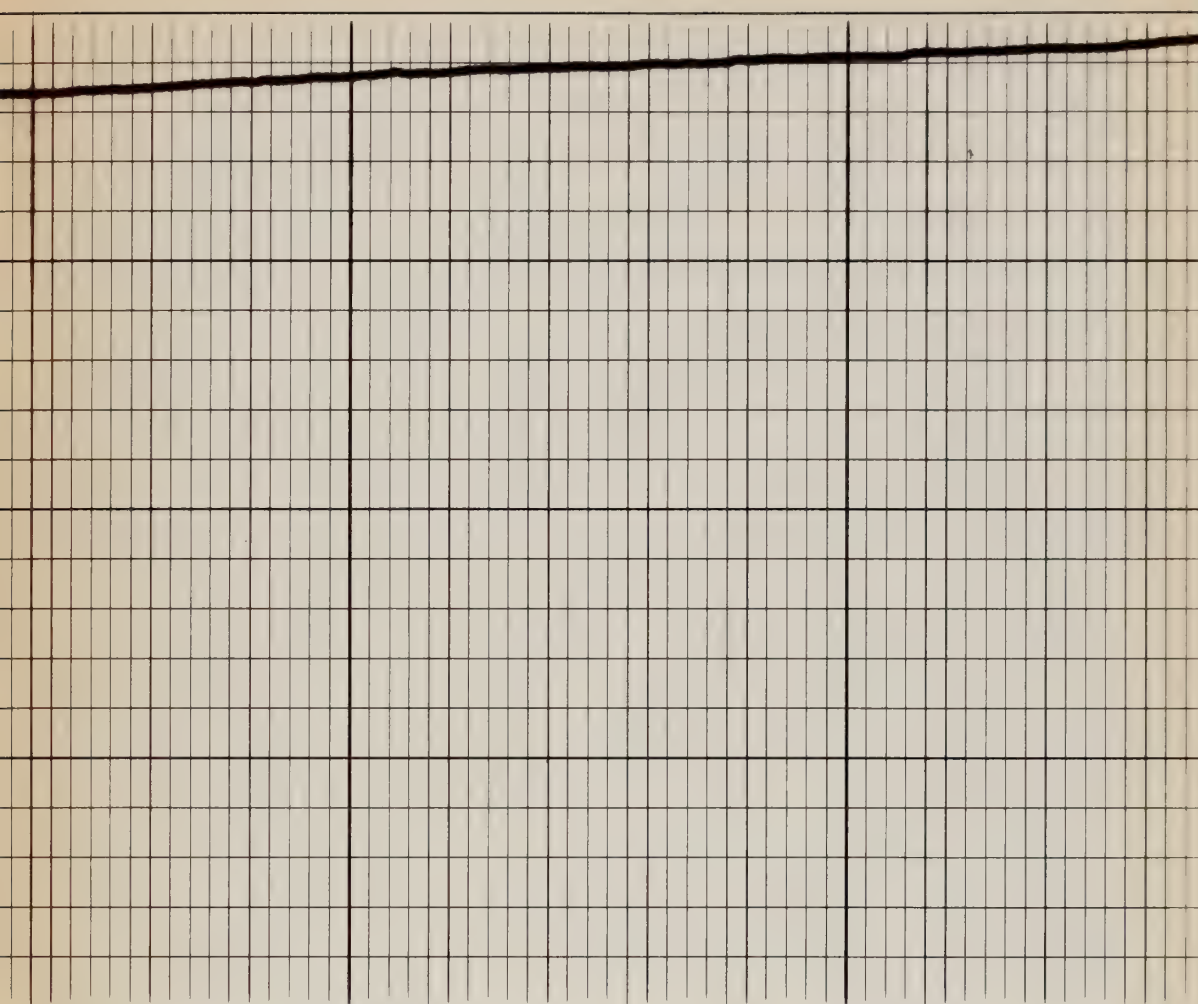
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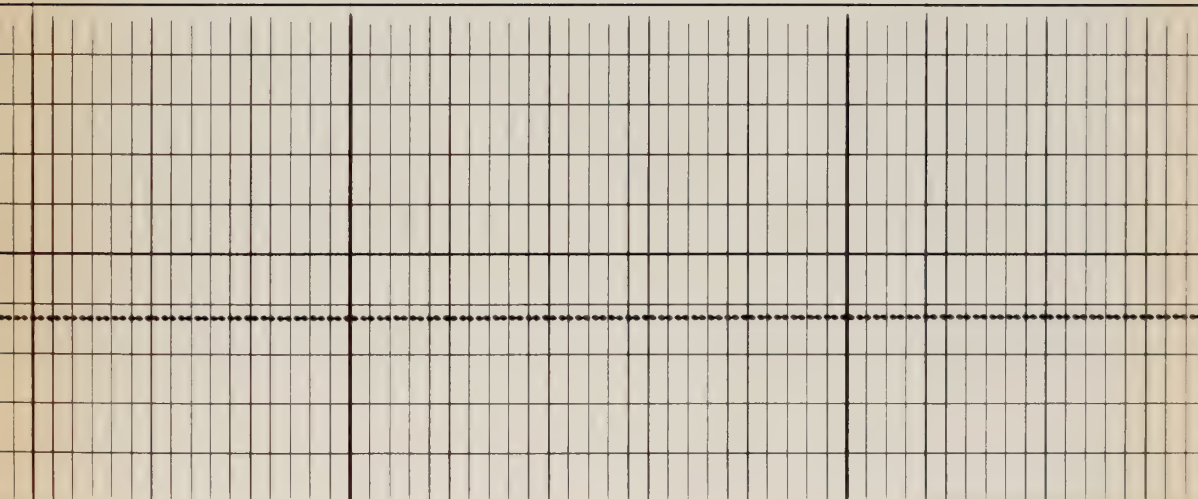


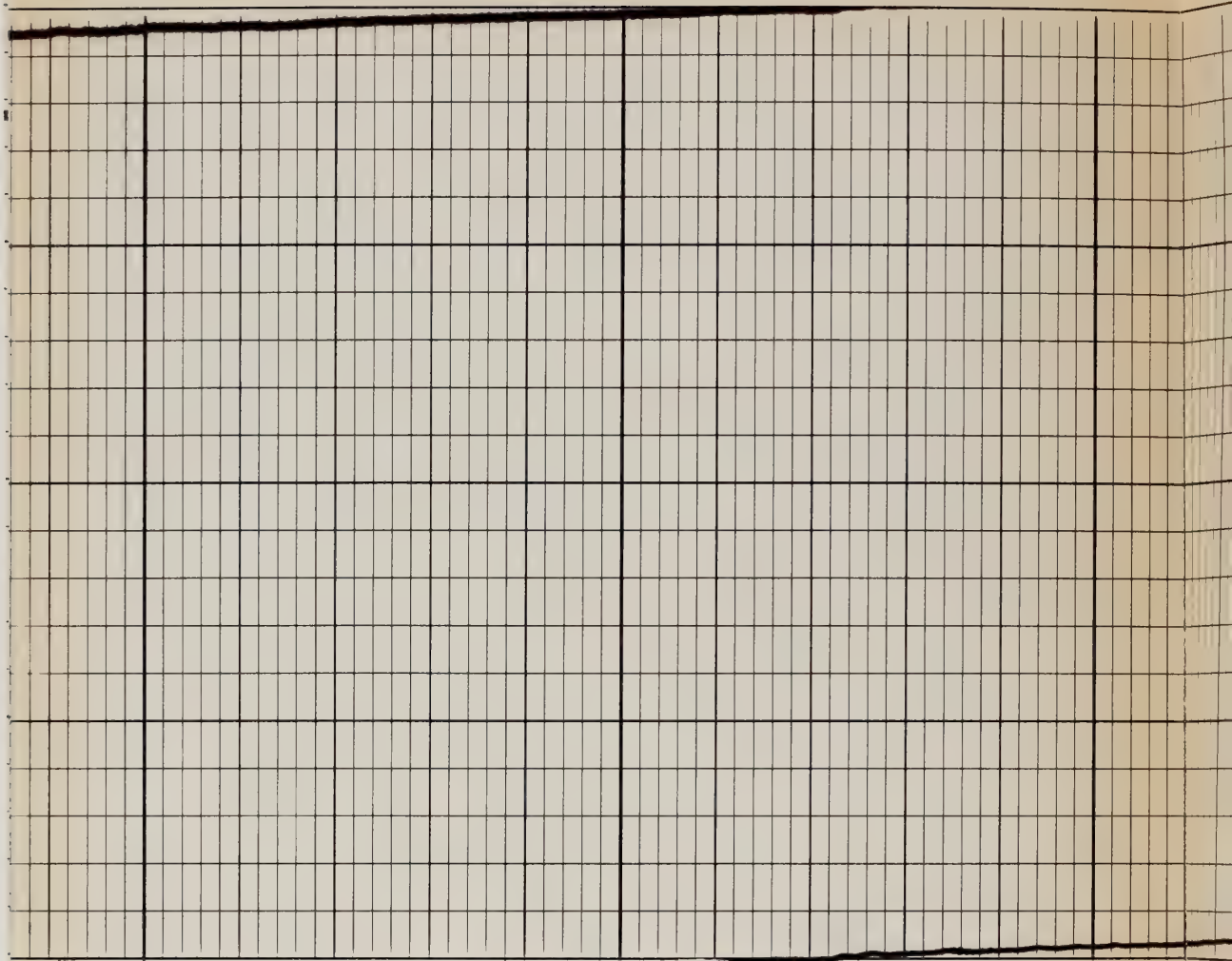
600





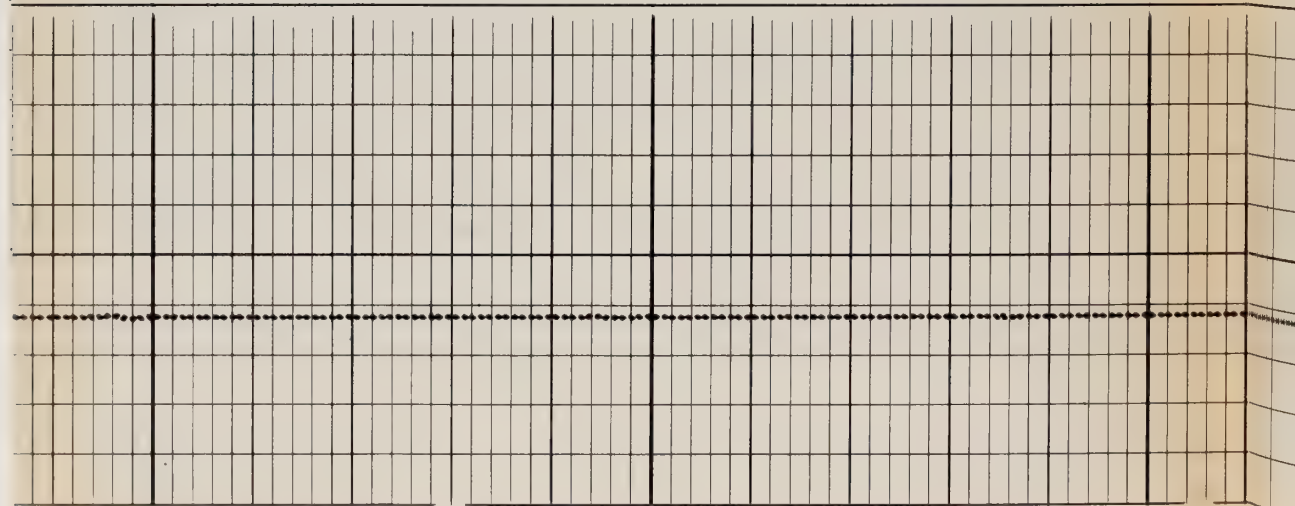
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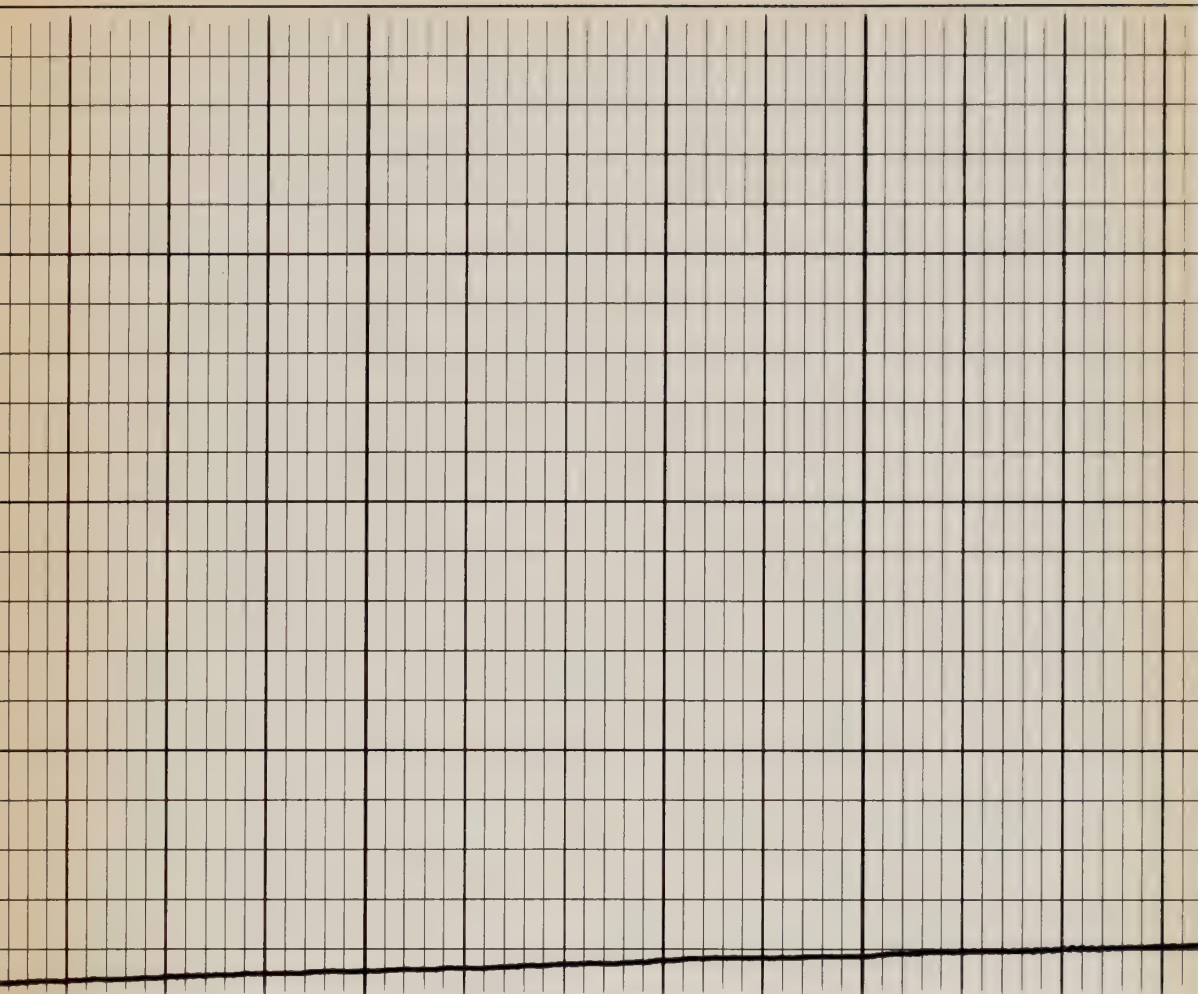




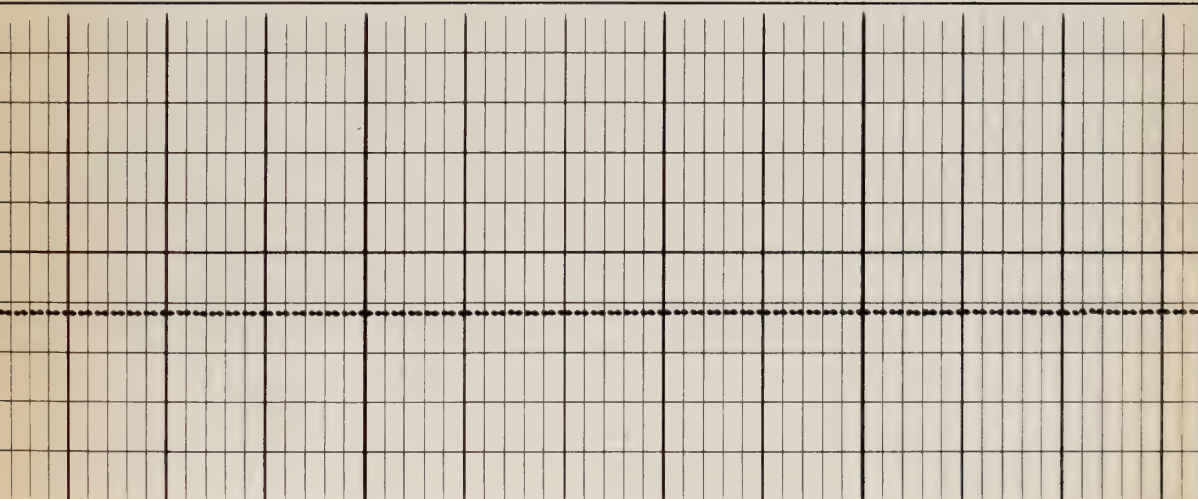
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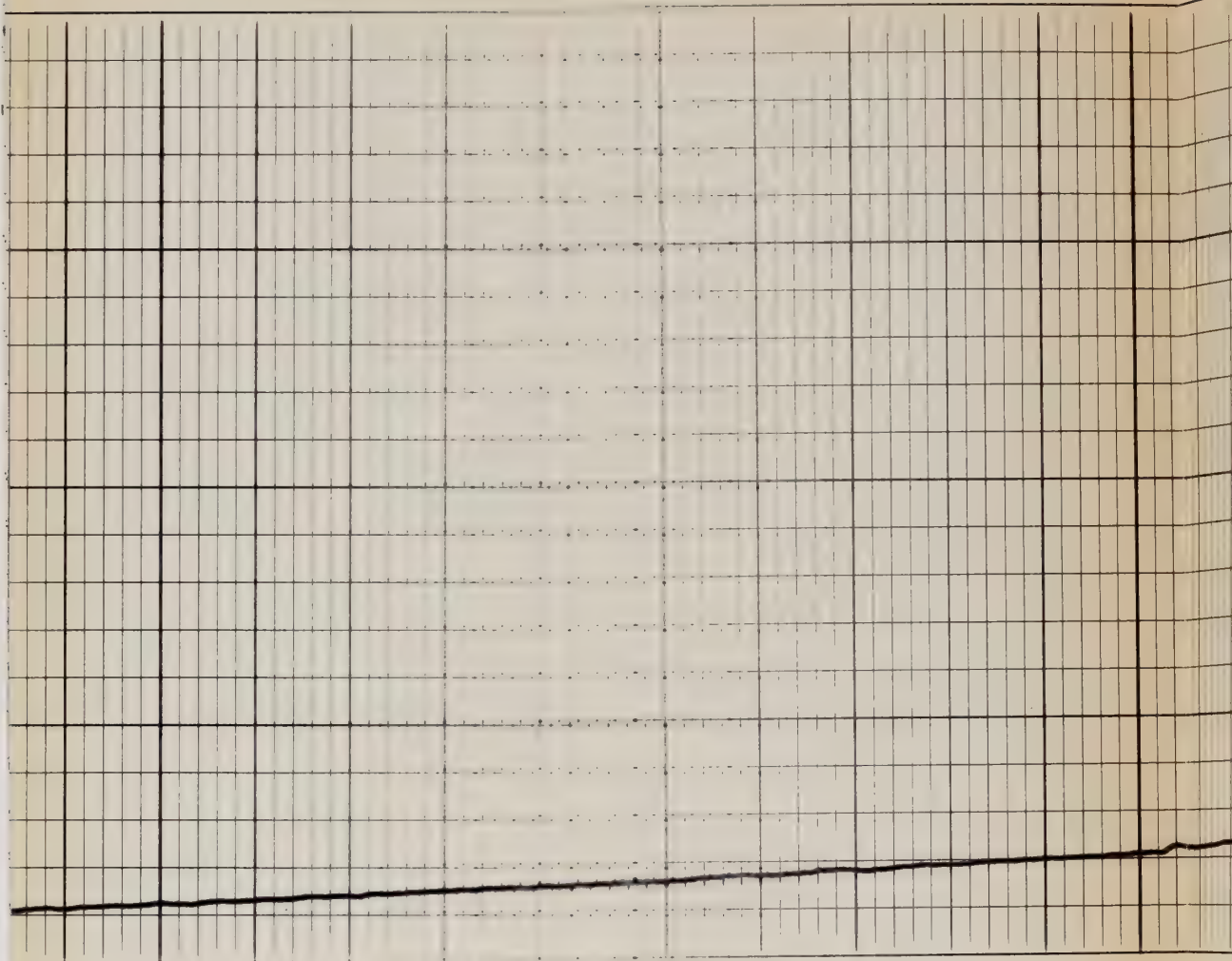
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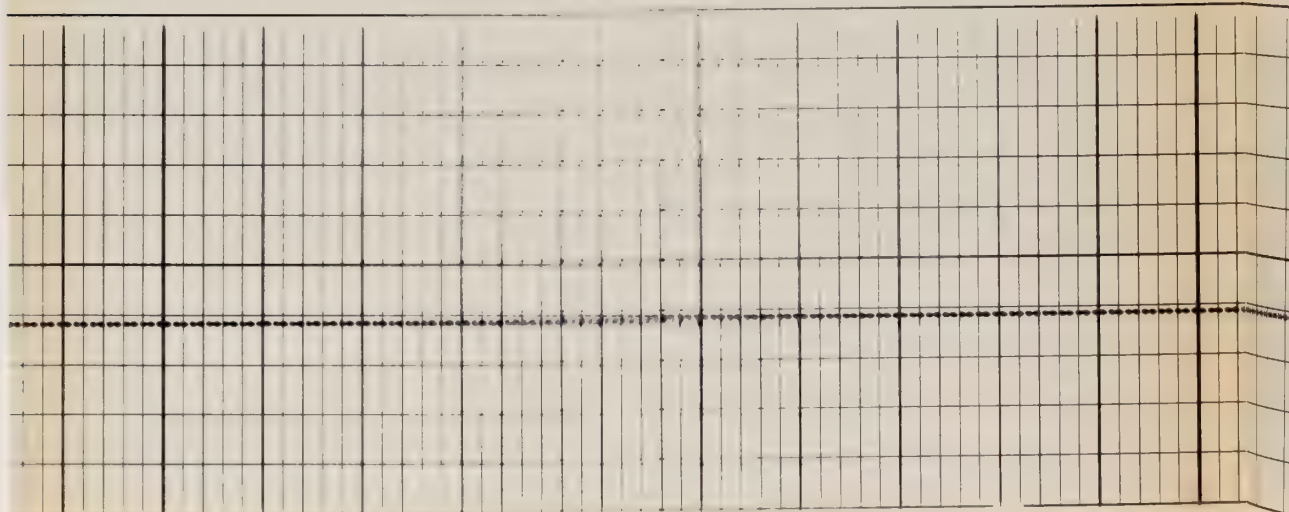


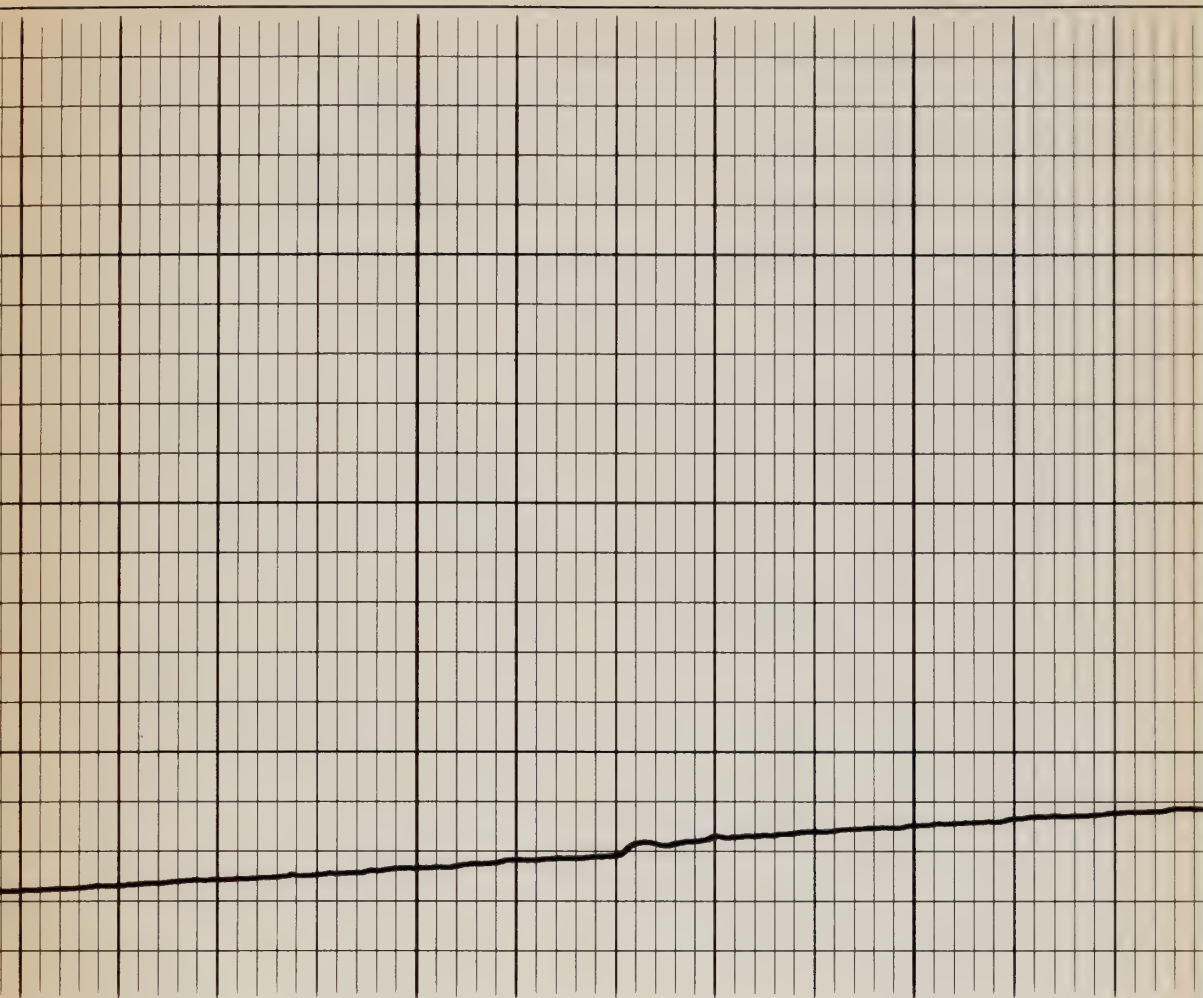
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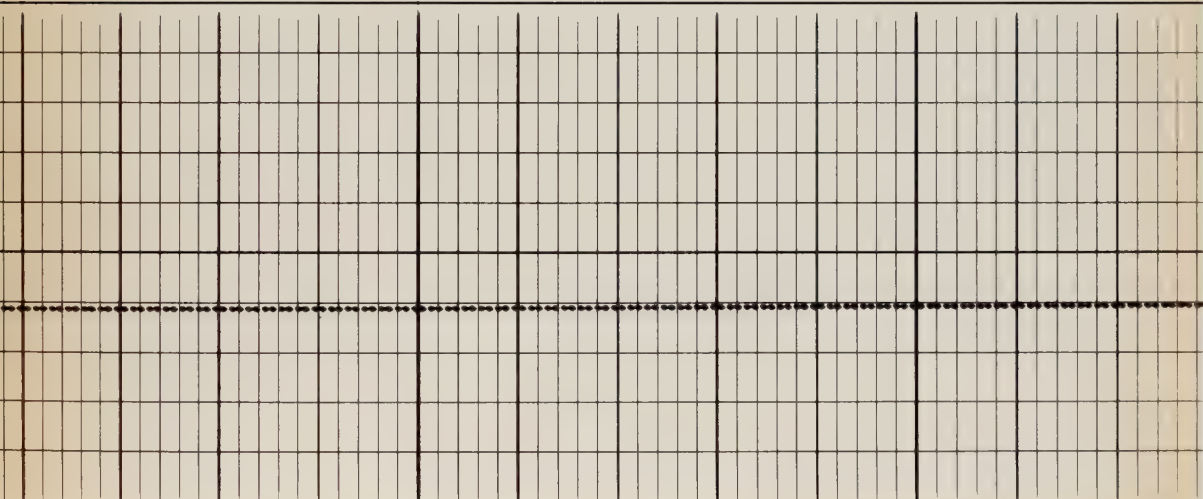


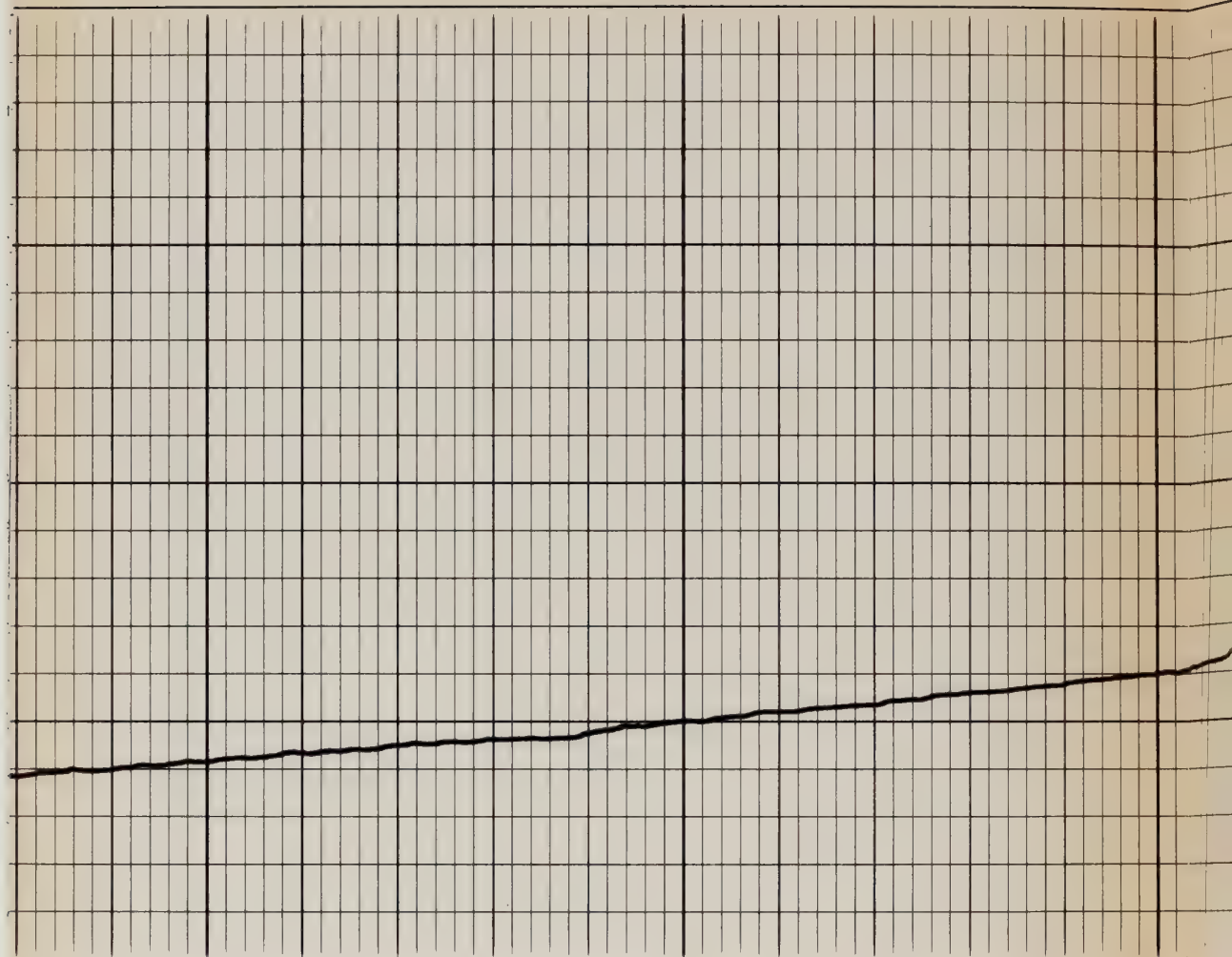
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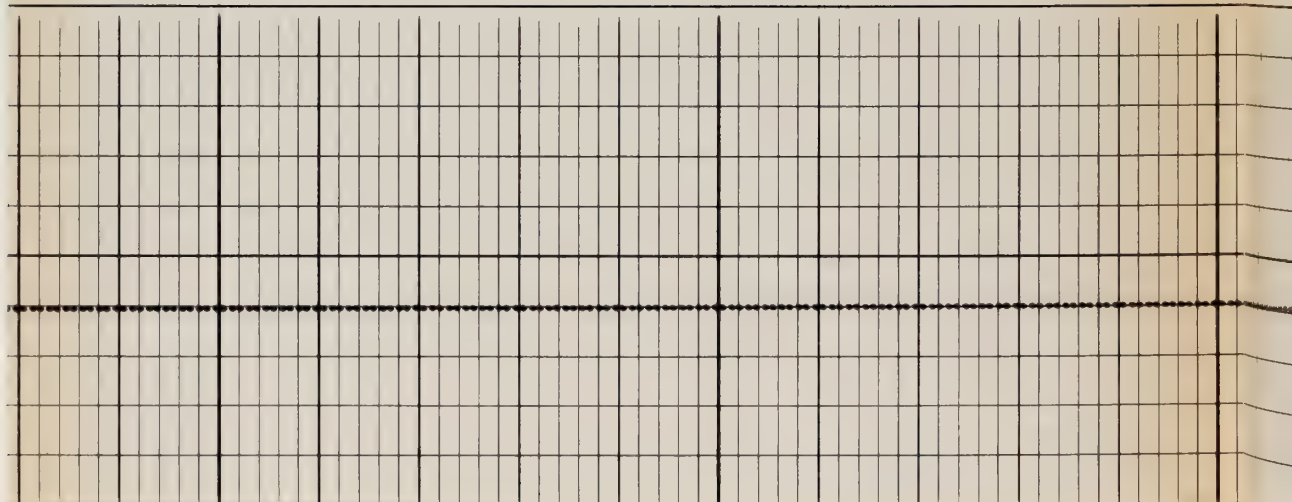
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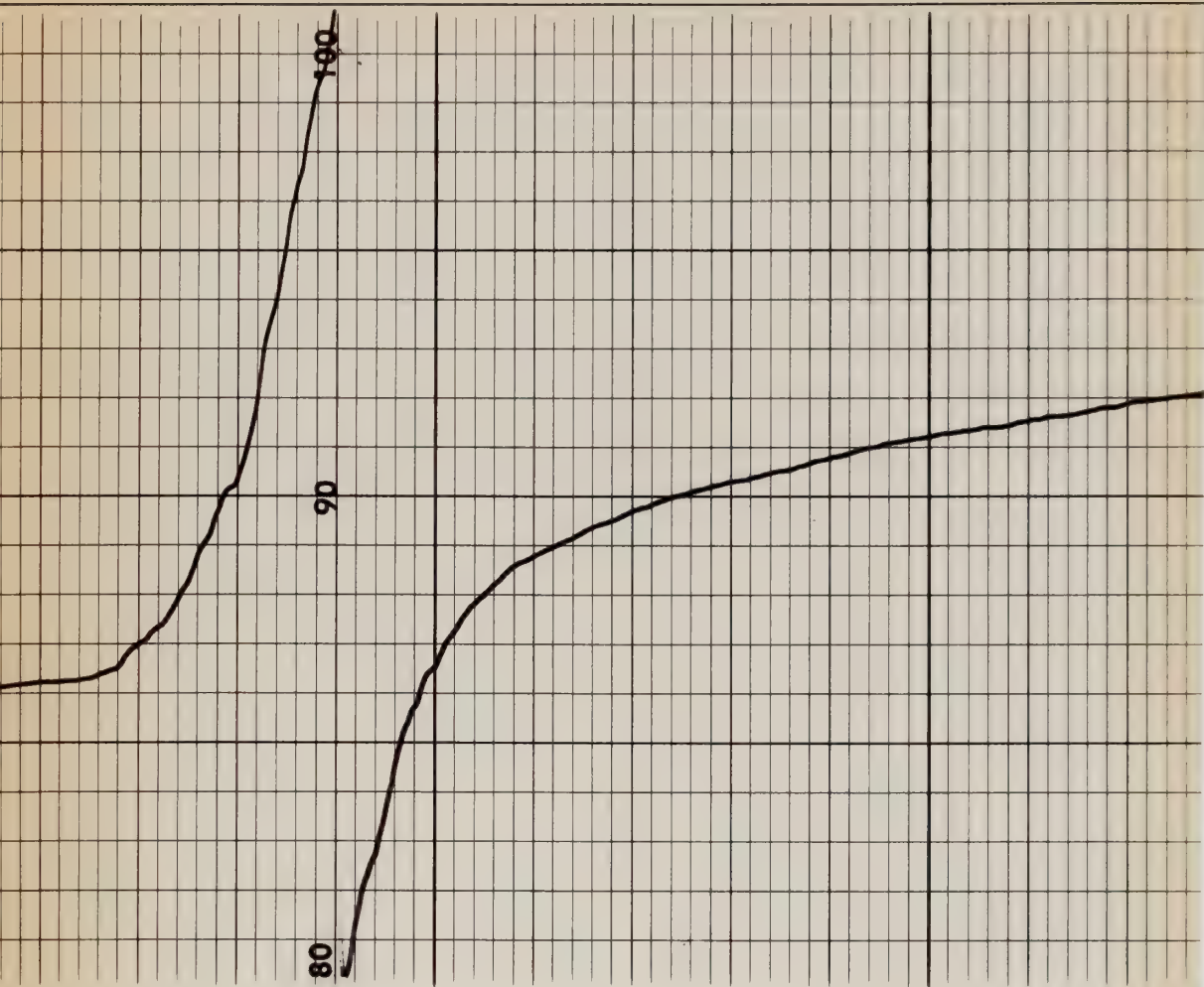




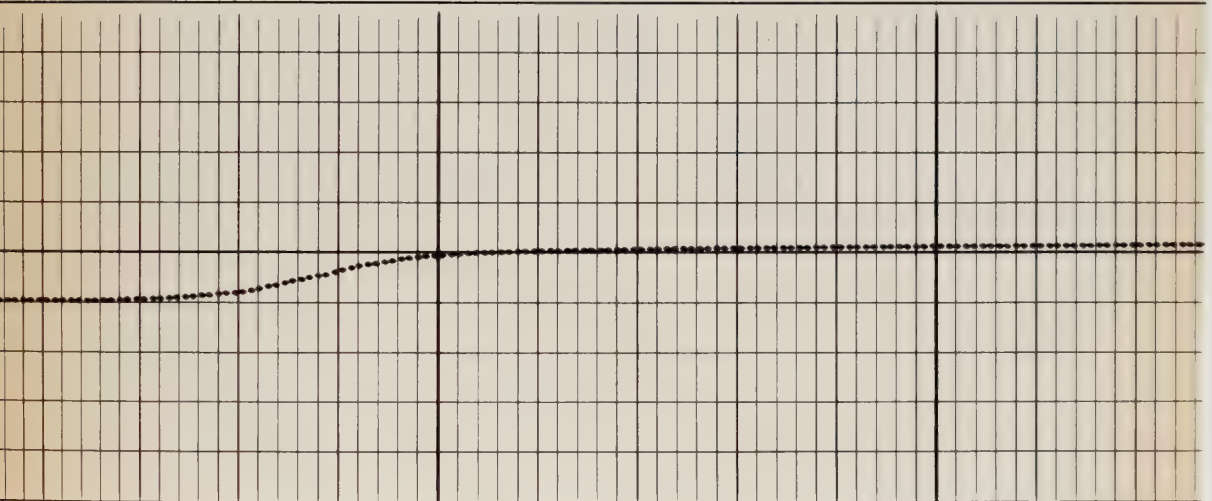
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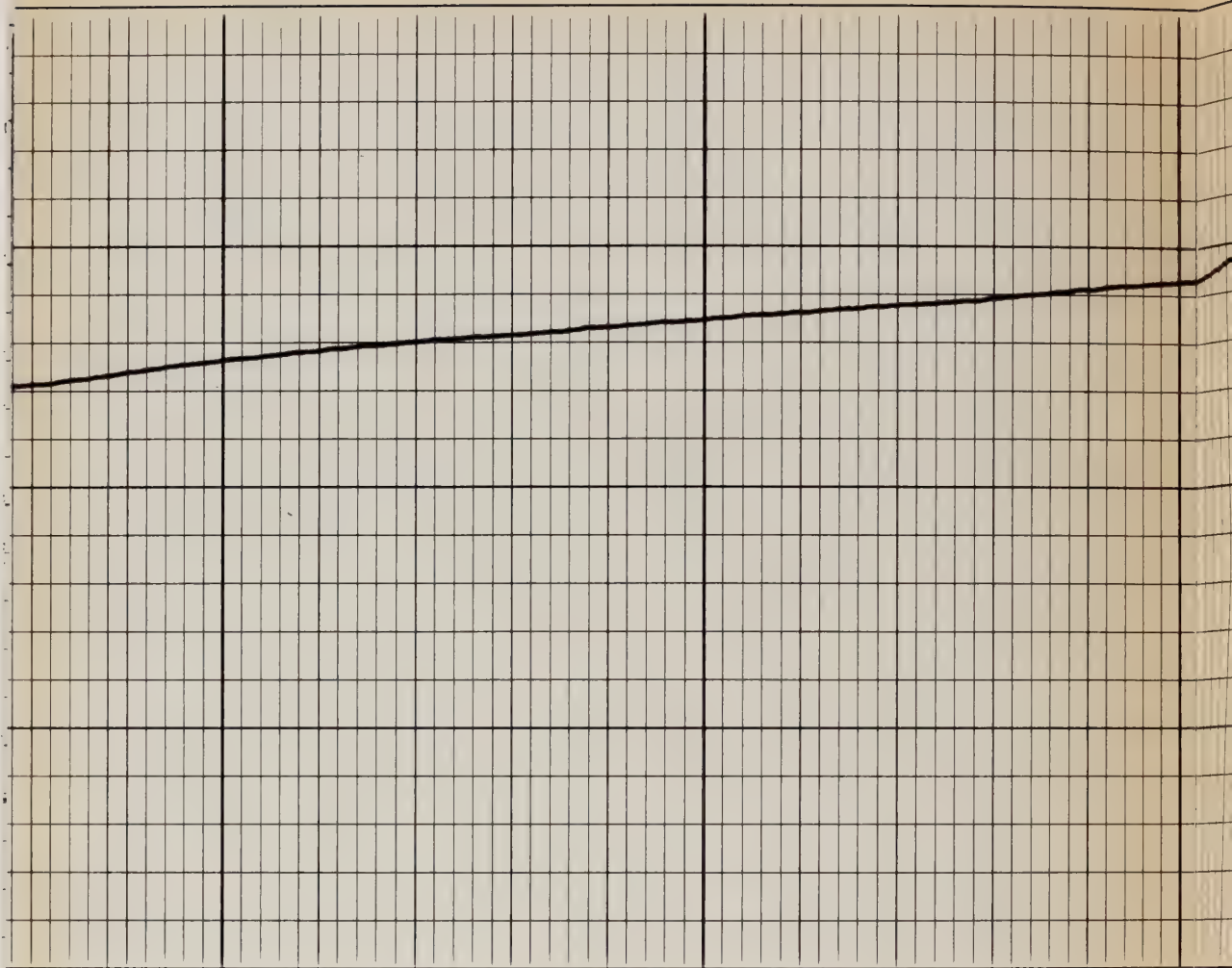
1400



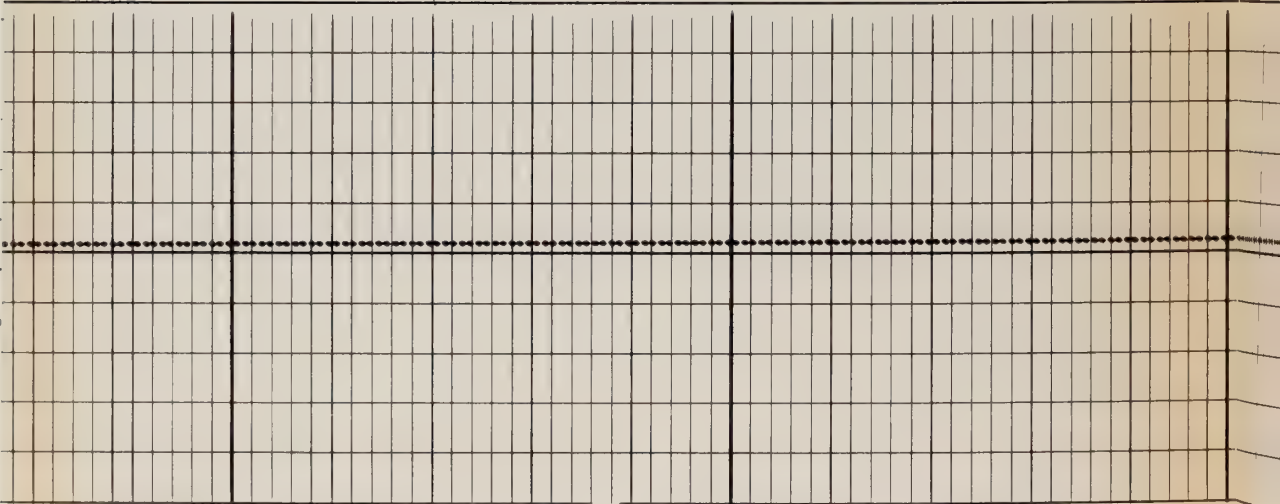


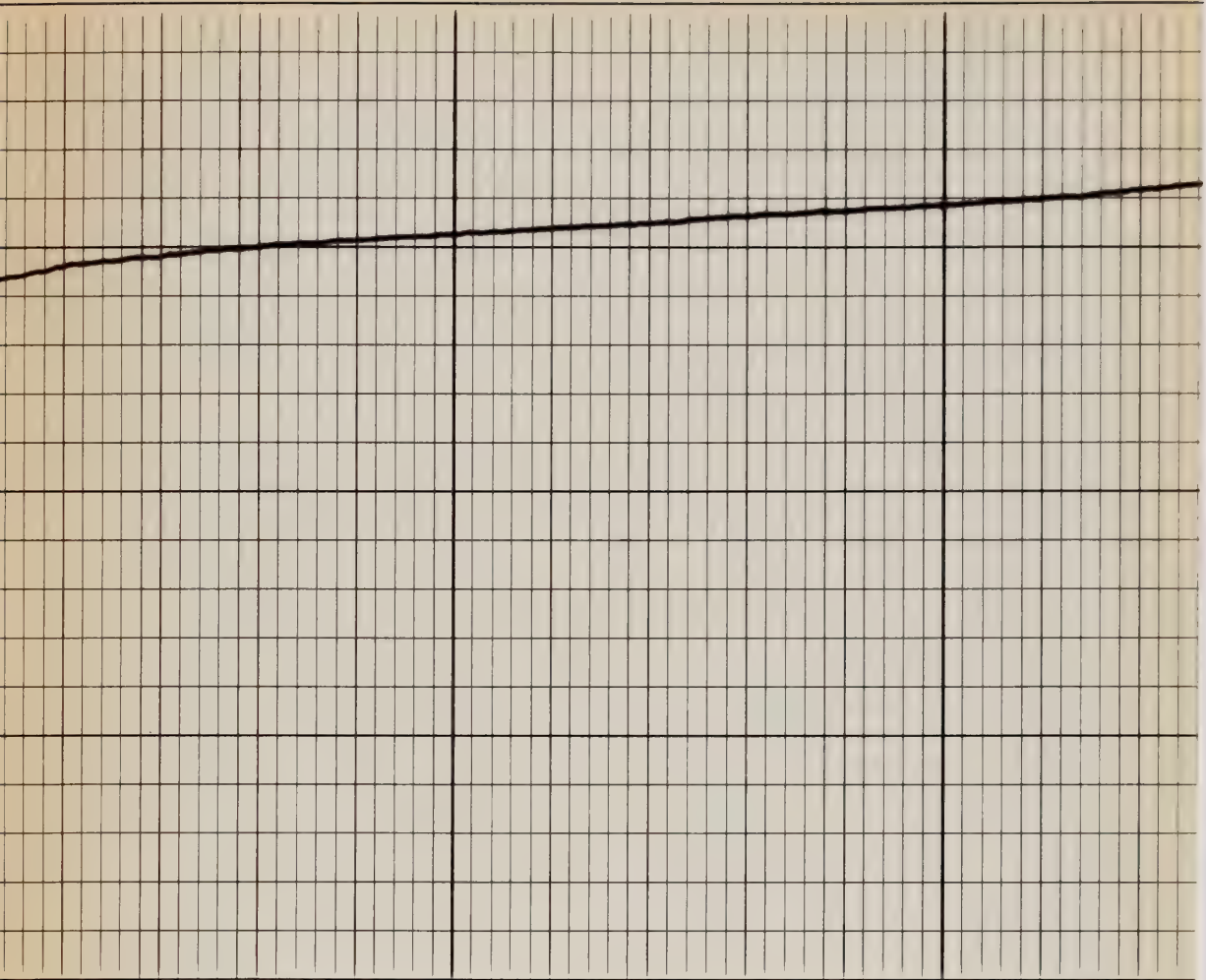
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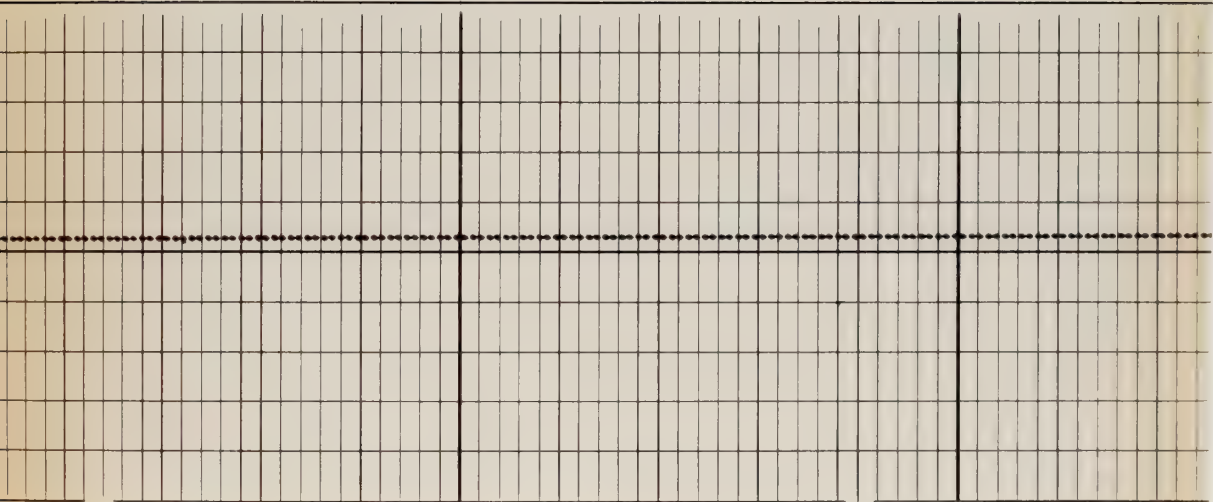


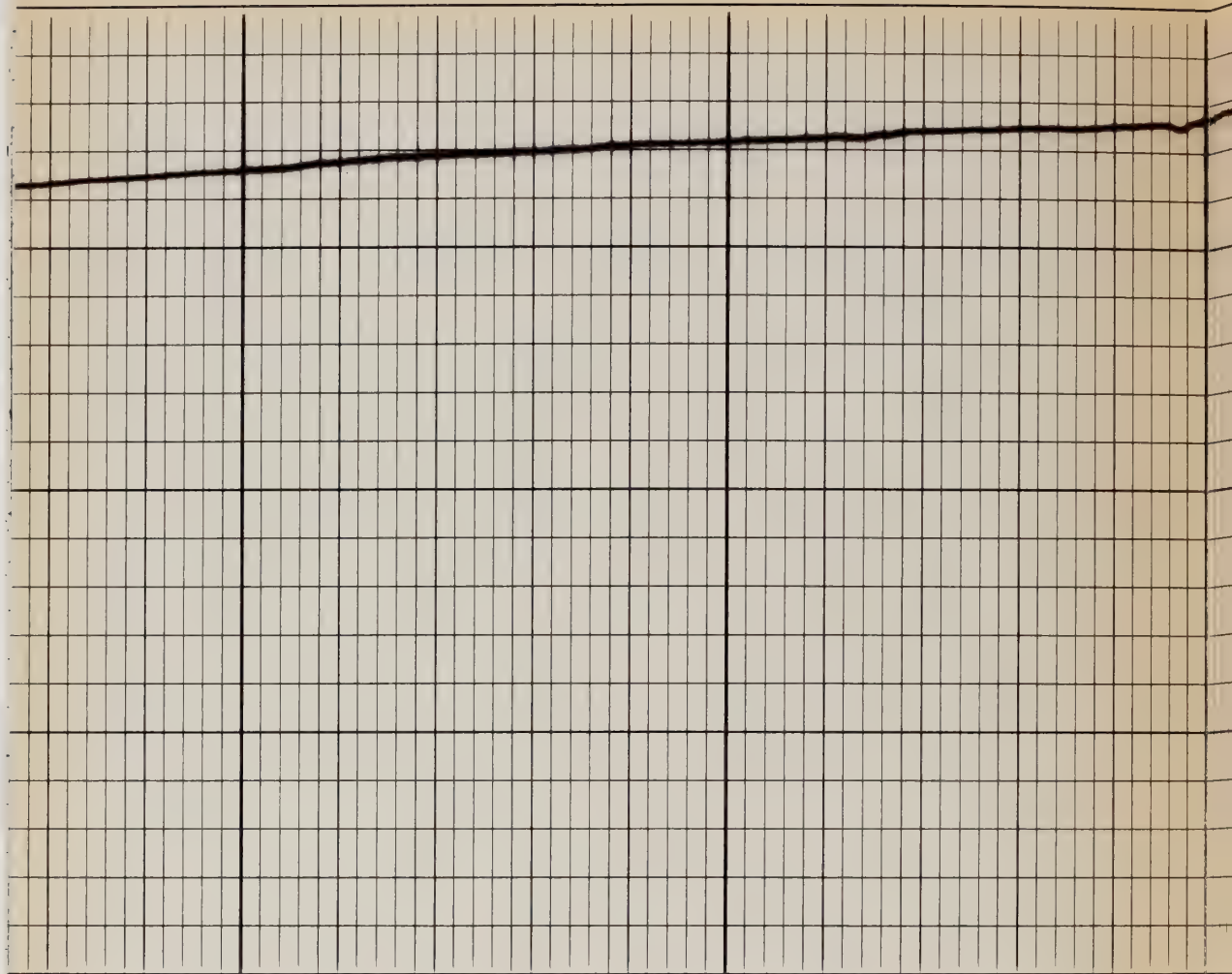
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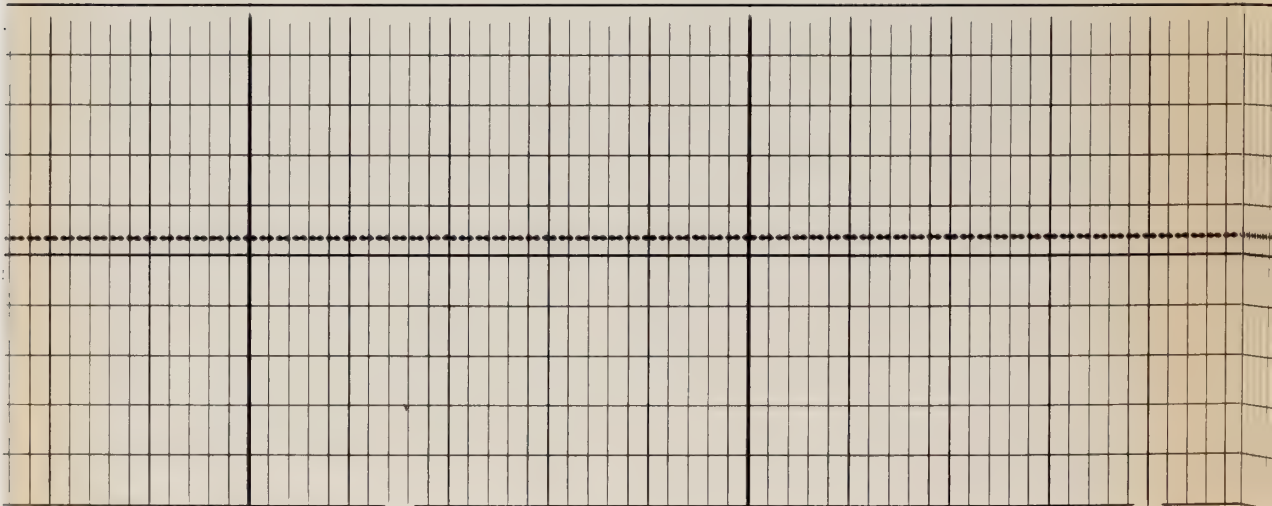
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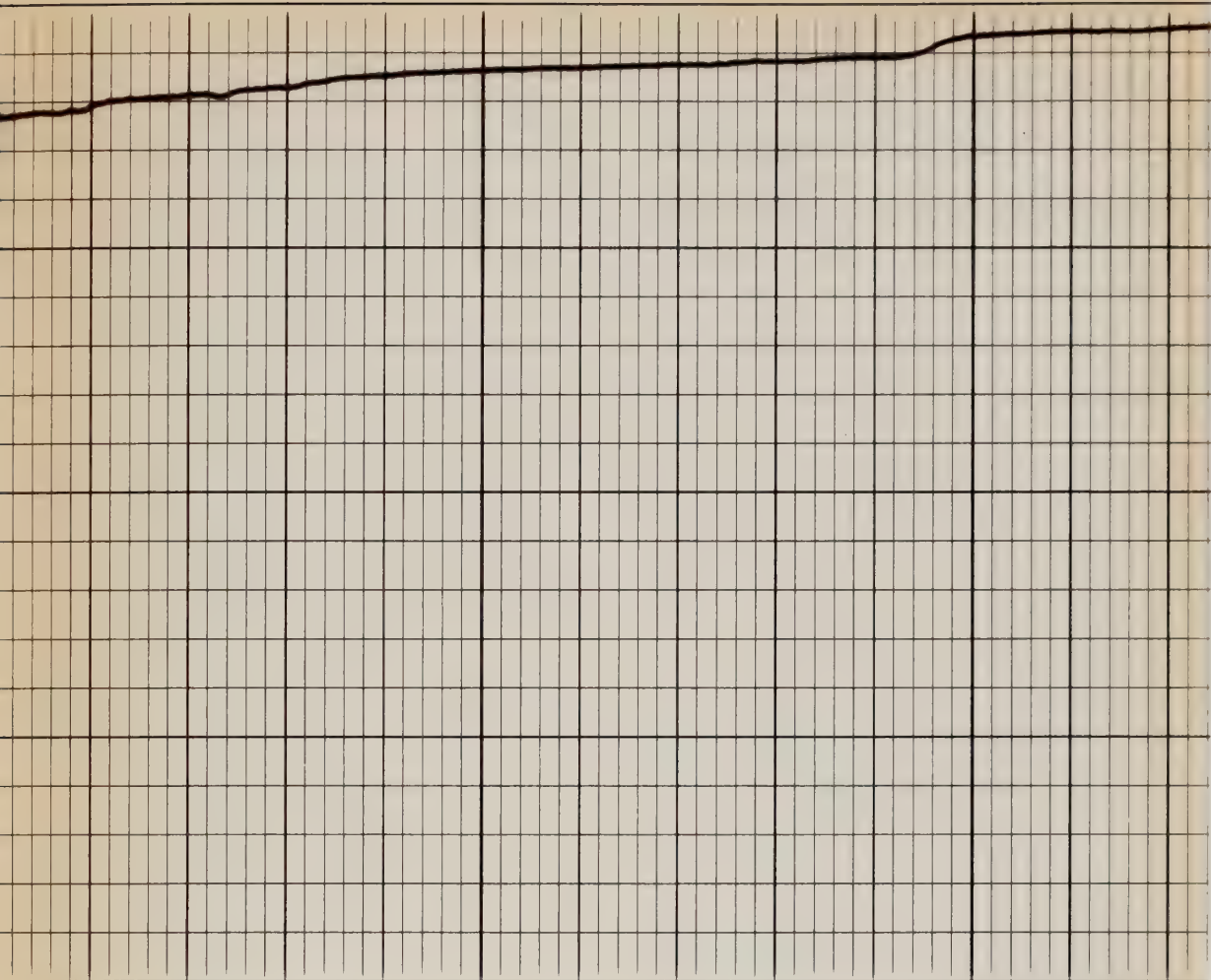




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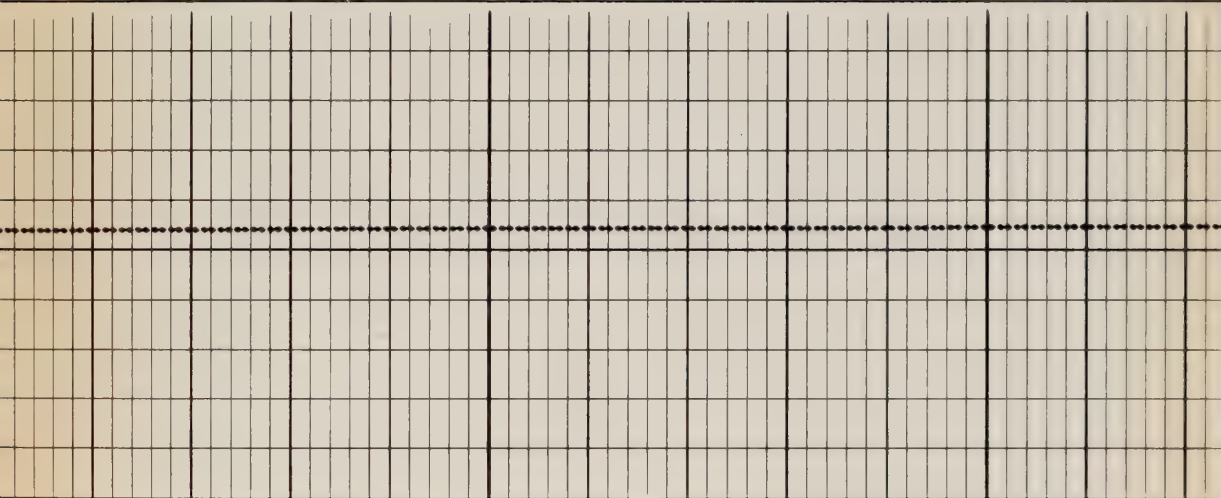
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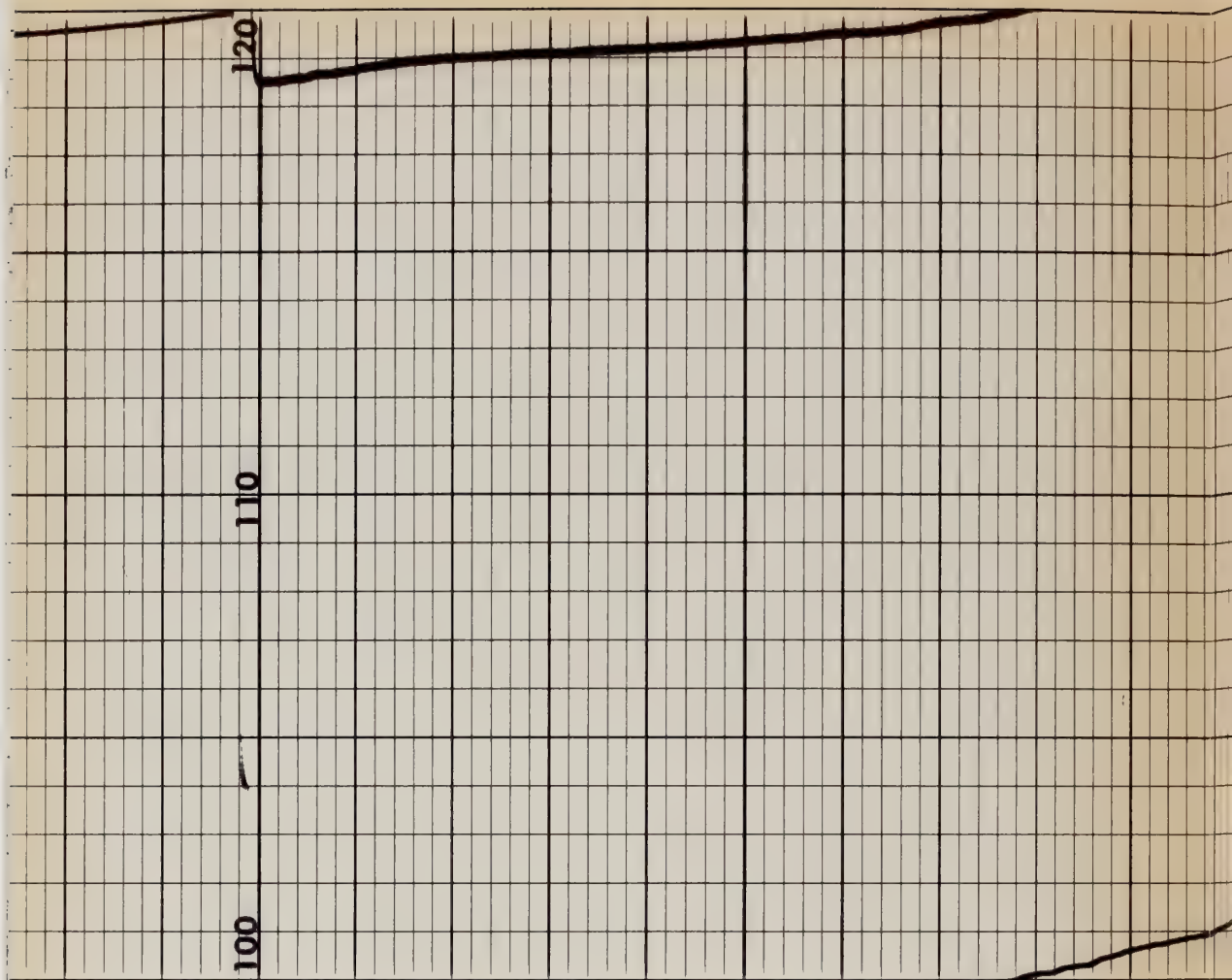




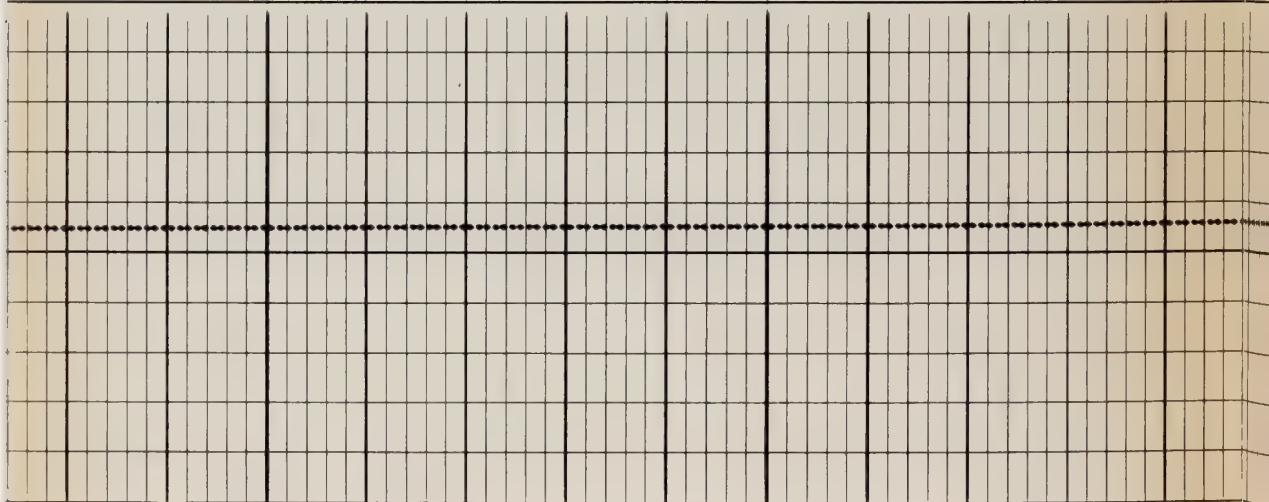
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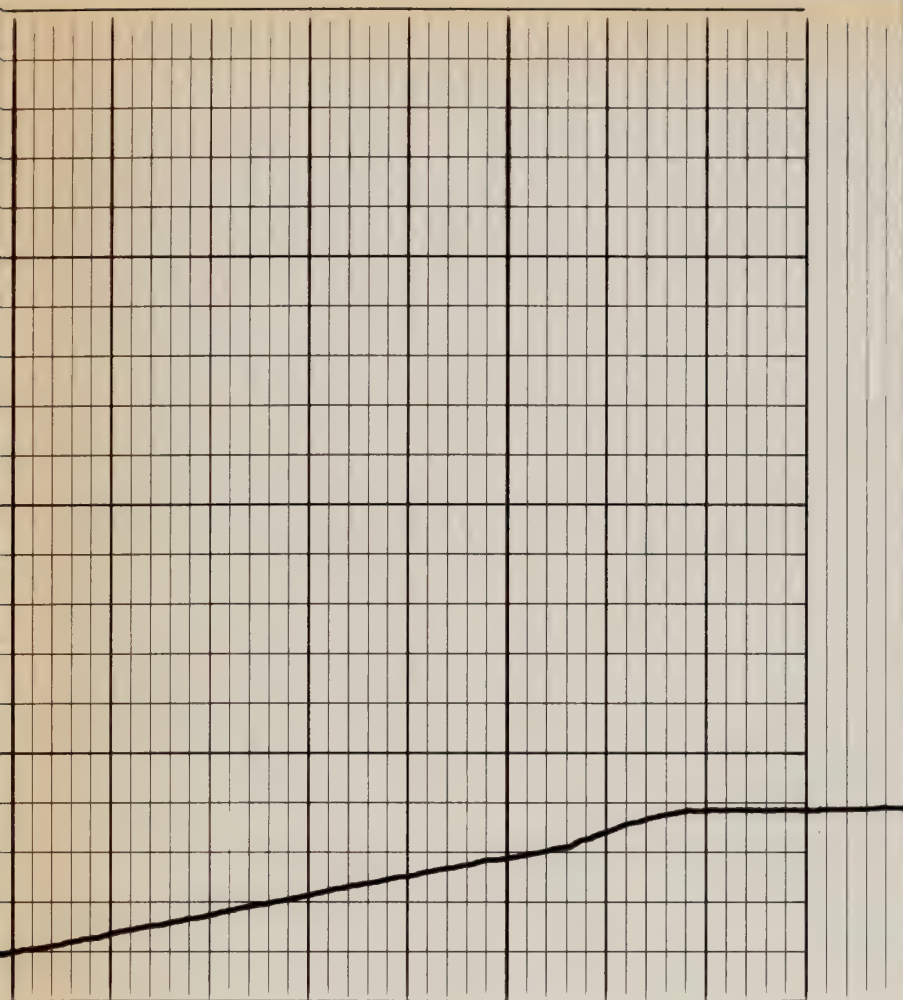
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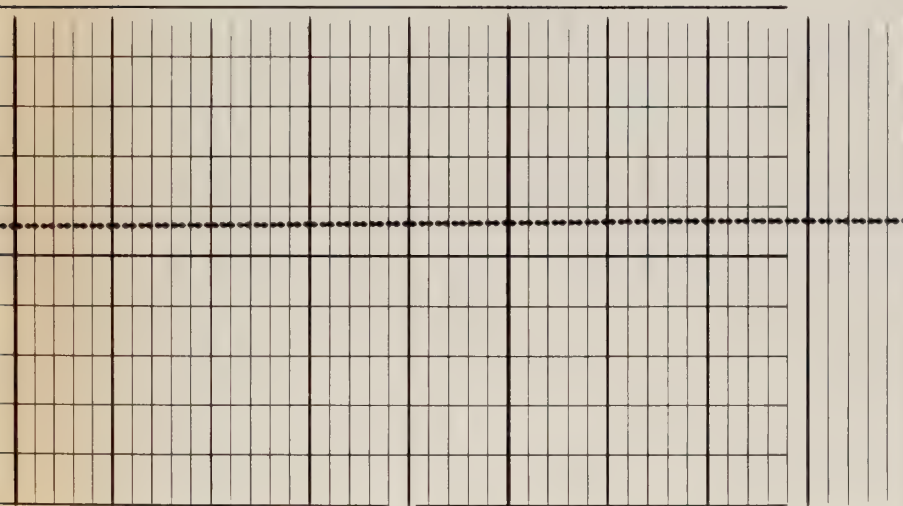


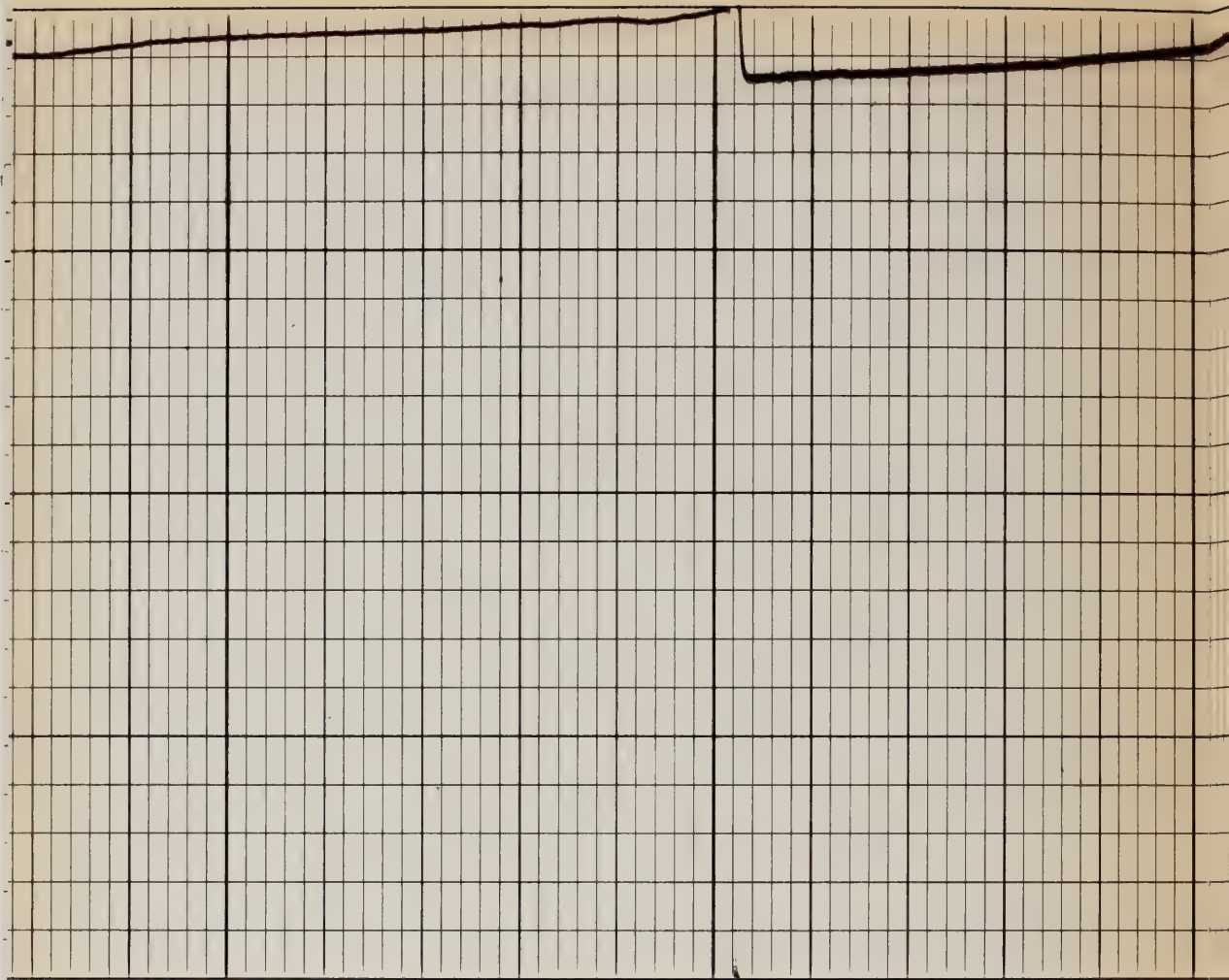
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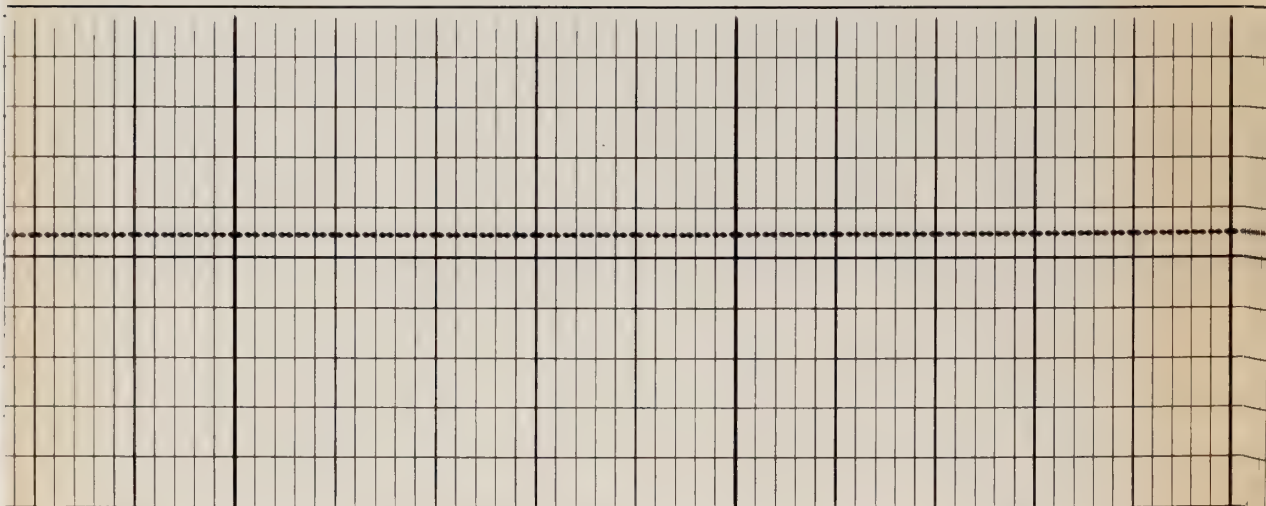


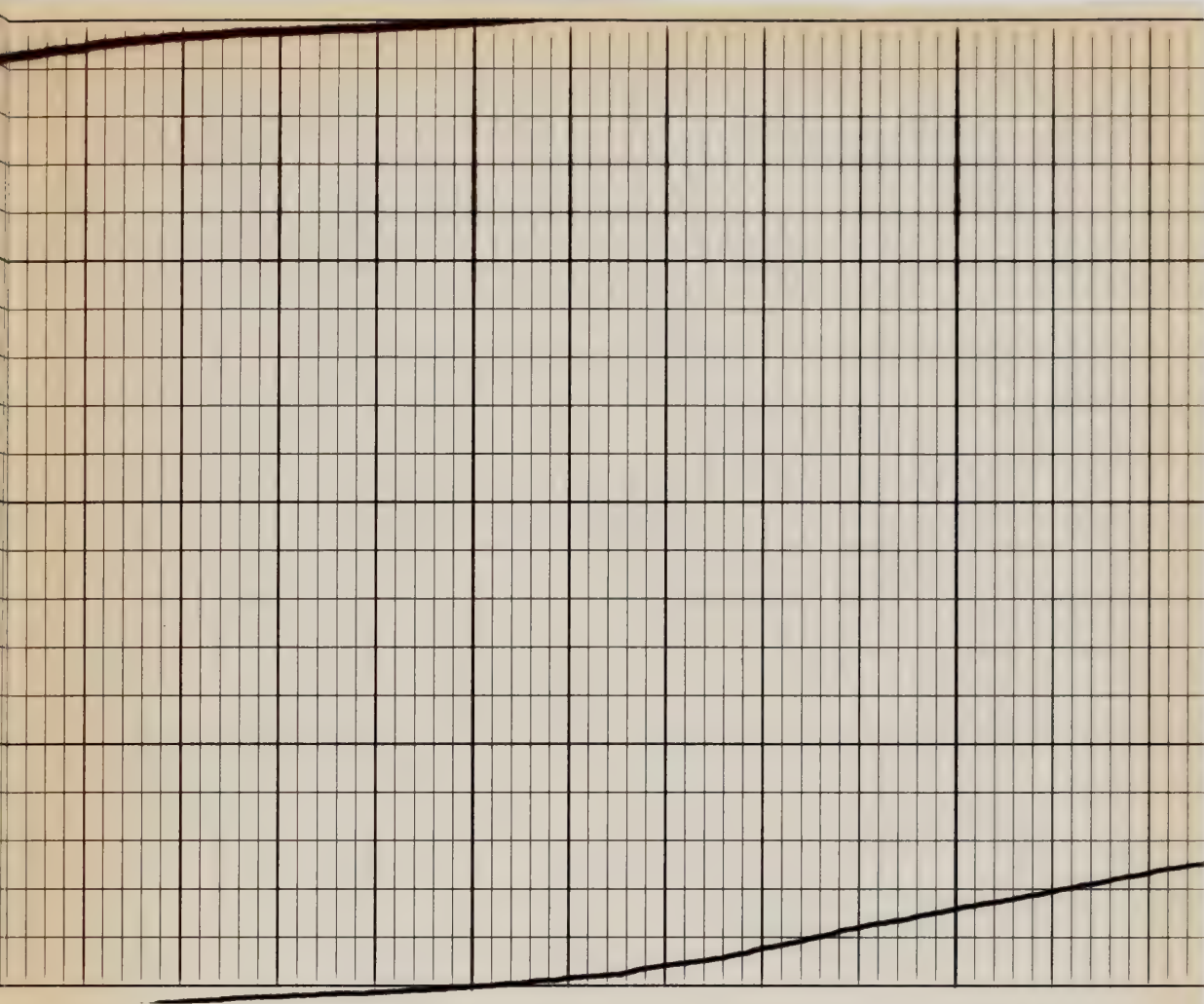
2200



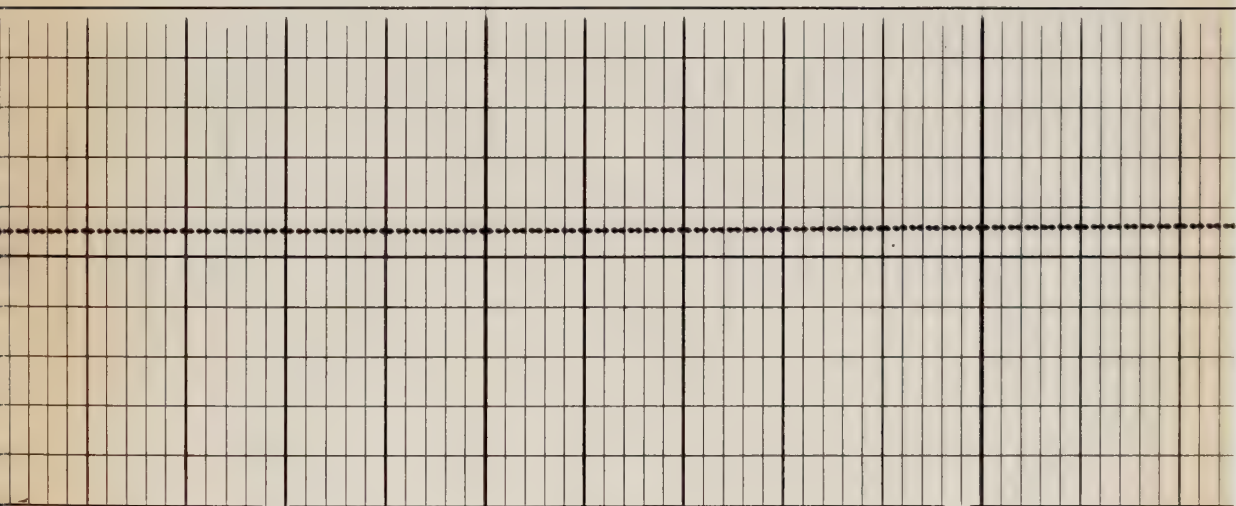


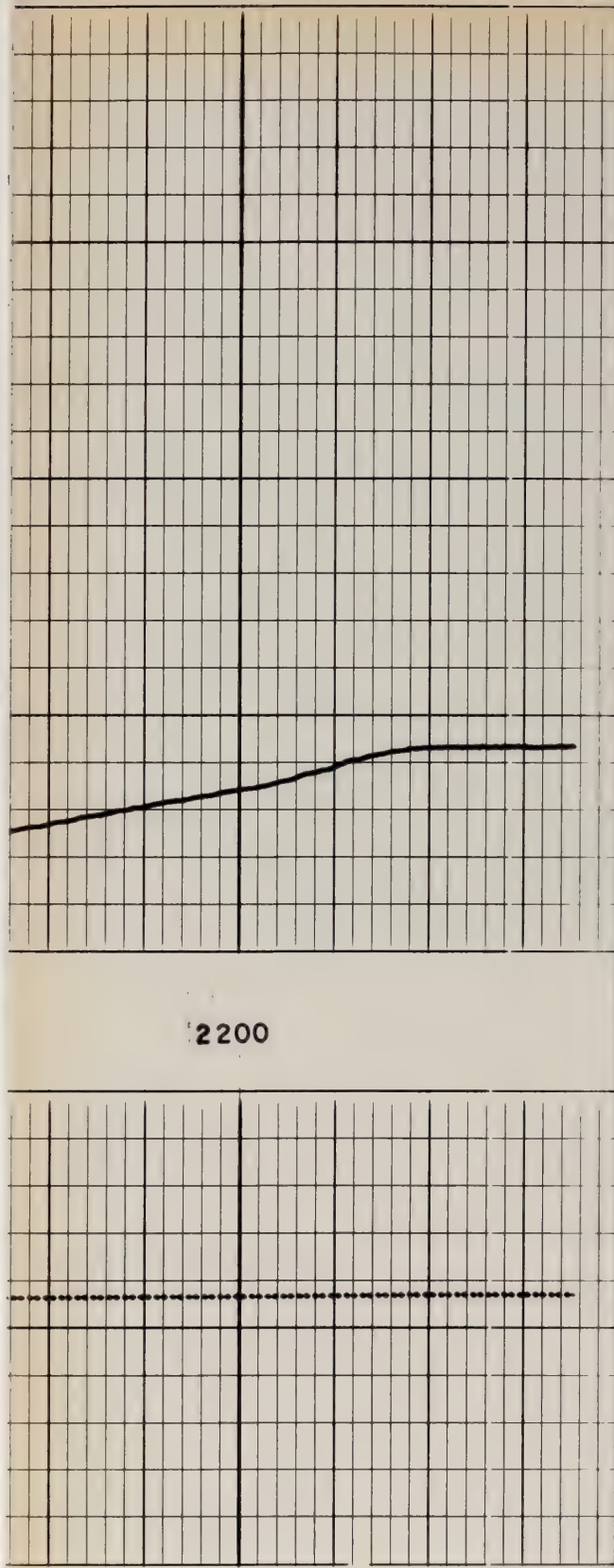
2000





2 100





TEMPERATURE ° F.

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO

STATE COLORADO

SCHL. F. R. 2220
SCHL. T. D. 2220
DRLR. T. D. 2220

COUNTY RIO BLANCO, COLORADO
FIELD or LOCATION SORGHUM GULCH

Permanent Log Measurement
Drilling Measurement

Date
Run No.

Depth-Drill
Depth-Log
Btm. Log Int
Top Log Int
Casing-Drill
Casing-Log
Bit Size
Type Fluid
Fluid Level

Dens.
pH Flu

Source of Sample
Rm @ Meas
Rmf @ Meas
Rmc @ Meas
Source: Rmf
Rm @ BHT
Time Since

Max. Rec. Temp
Equip. Location
Recorded By
Witnessed By

Schlumberger

BOREHOLE COMPENSATED SONIC LOG - GAMMA RAY

(WITH CALIPER)

COUNTY RIO BLANCO, COLORADO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH #6
COMPANY ATLANTIC RICHFIELD

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO, COLORADO

Location:

2523 FSL & 2251 FWL

Sec. 7 Twp. 3S Rge. 96W

Other Services:

DIL
FDC--CNL-GR
HRT

Permanent Datum: GL; Elev.: 6888

Log Measured From GL 0 Ft. Above Perm. Datum

Drilling Measured From GL

Elev.: K.B.

D.F.

G.I. 6888

Date	<u>8/23/74</u>				
Run No.	<u>ONE</u>				
Depth—Driller	<u>2220</u>				
Depth—Logger	<u>2220</u>				
Btm. Log Interval	<u>2219</u>				
Top Log Interval	<u>466</u>				
Casing—Driller	<u>8-5/8@ 59</u>	<u>@</u>	<u>@</u>	<u>@</u>	<u>@</u>
Casing—Logger					
Bit Size	<u>6-1/4</u>				
Type Fluid in Hole	<u>WATER</u>				
Fluid Level	<u>466</u>				
Dens.	Visc.				
pH	Fluid Los	ml	ml	ml	ml
Source of Sample					
Rm @ Meas. Temp.	<u>@</u>	<u>°F</u>	<u>@</u>	<u>°F</u>	<u>@</u>
Rmf @ Meas. Temp.	<u>@</u>	<u>°F</u>	<u>@</u>	<u>°F</u>	<u>@</u>
Rmc @ Meas. Temp.	<u>@</u>	<u>°F</u>	<u>@</u>	<u>°F</u>	<u>@</u>
Source: Rmf	Rmc				
Rm @ BHT	<u>@</u>	<u>°F</u>	<u>@</u>	<u>°F</u>	<u>@</u>
Time Since Circ.	<u>14 HOURS</u>				
Max. Rec. Temp.	<u>104</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>
Equip.	Location	<u>5602</u>	<u>GJ</u>		
Recorded By	<u>BARGHOUTI</u>				
Witnessed By	<u>ELLARD, TAIT</u>				

The well name, location and level are indicated by the well name, location and level.

the well known, numerous and diverse reference unit were furnished by the customer.

CALIBRATION DATA						
CALIBRATION	BACKGROUND CPS.	SOURCE CPS.	GALV. INCR. DIVISION	SENS. TAP (FOR CAL)	SENS. TAP (RECORD)	TIME CONST.
GAMMA RAY	140	580	100	150	150	1

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not warrant the accuracy

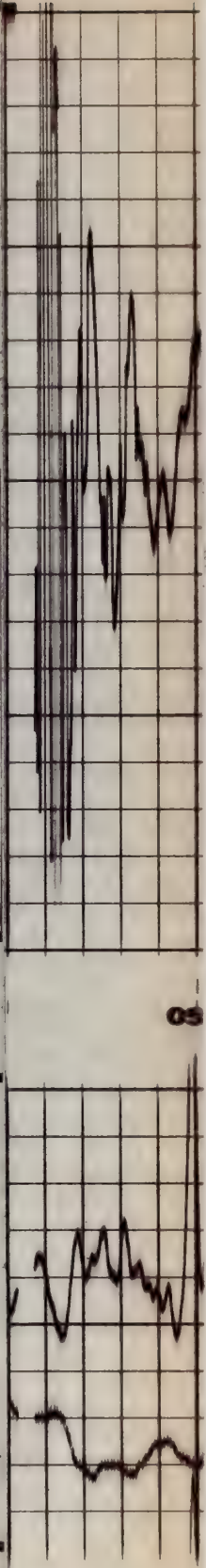
GAMMA RAY:	140	580	DIVISION	100	150	(RECORD)	150	CONSL.	1

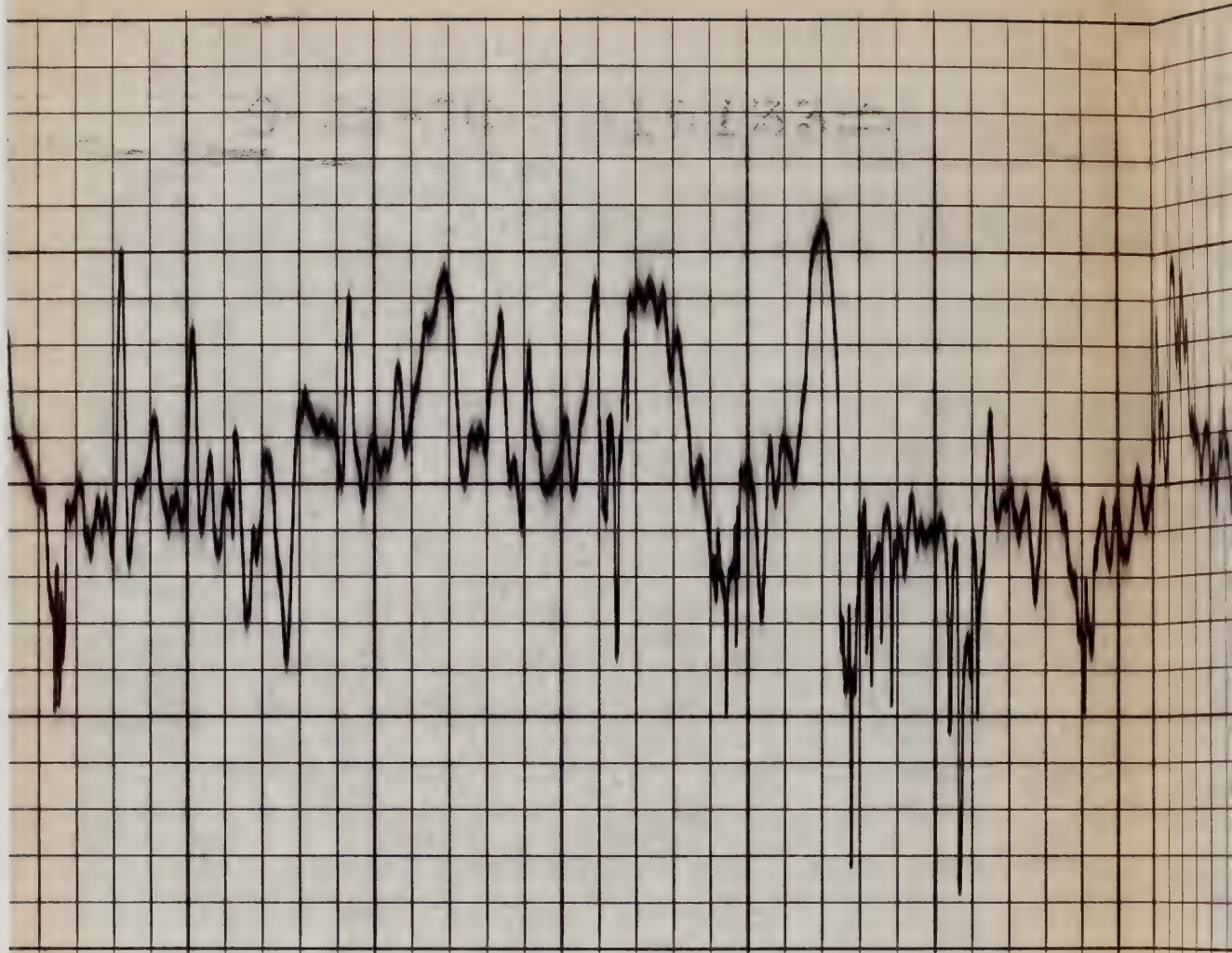
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

GAMMA RAY API UNITS	DEPTHS	INTERVAL TRANSIT TIME MICROSECONDS PER FOOT
0	150	50
150	300	100
		200
		150

T3 R1 2 R2

CALIPER HOLE DIAM. IN INCHES



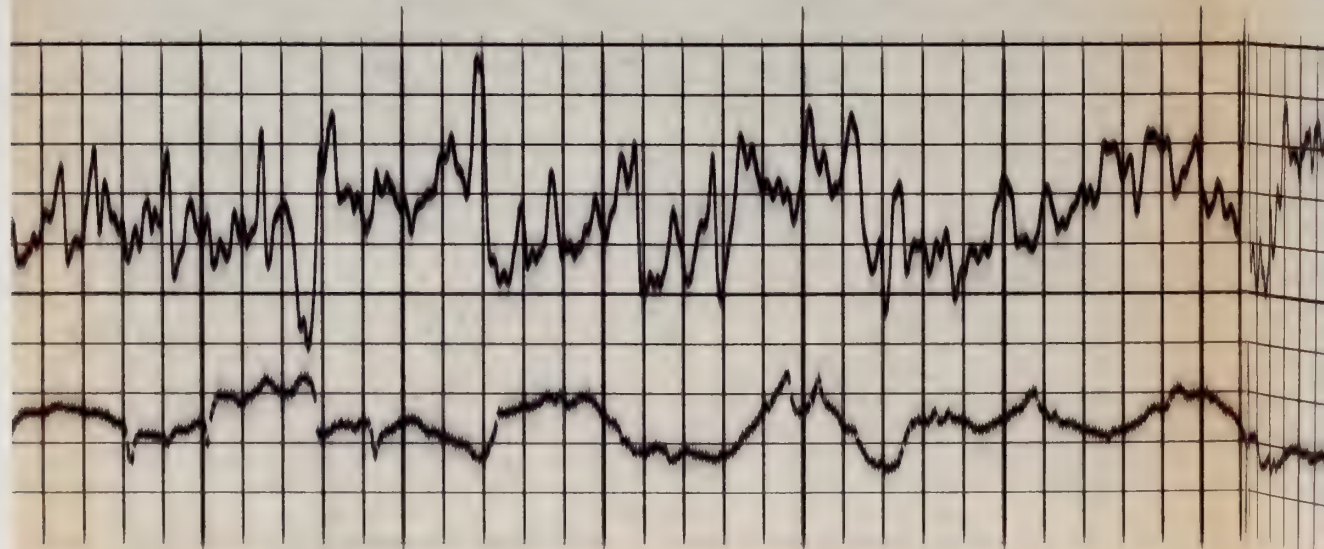


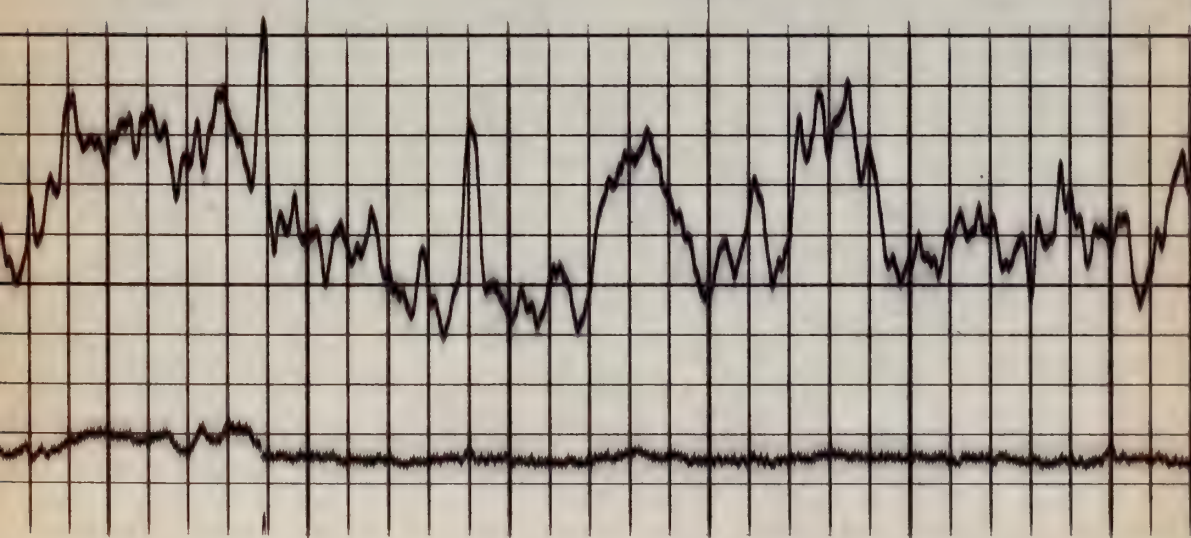
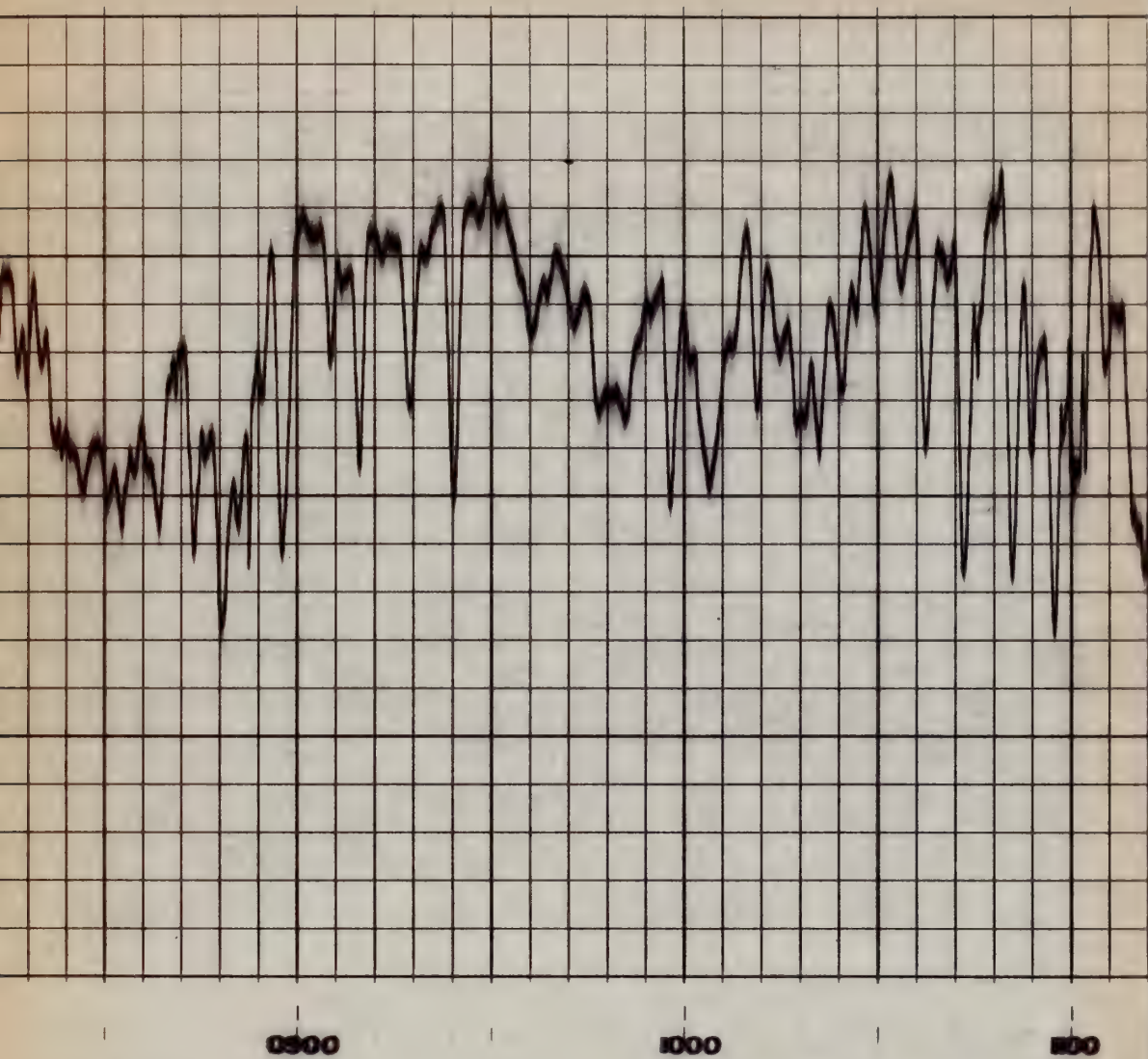
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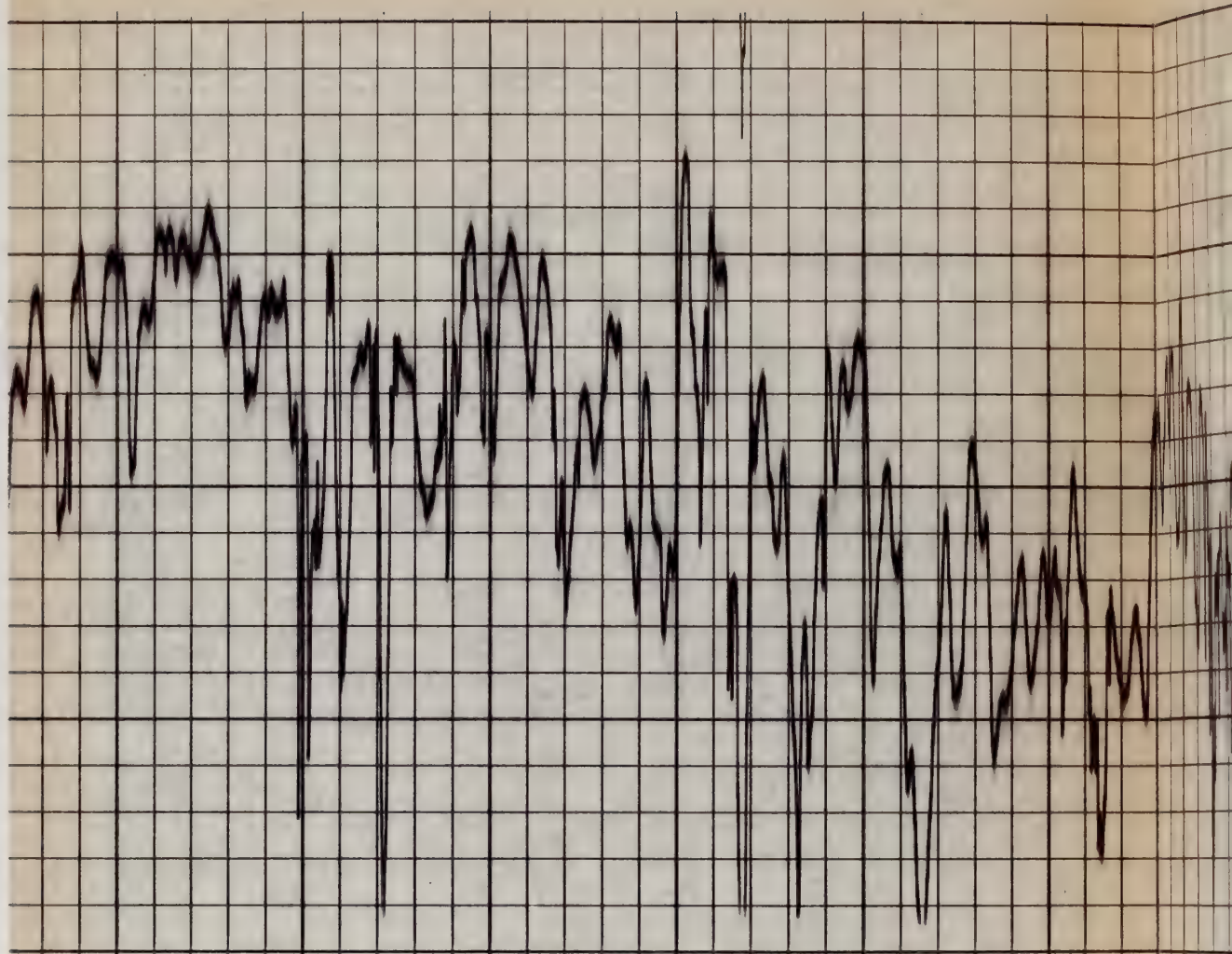
0600

0700

0800



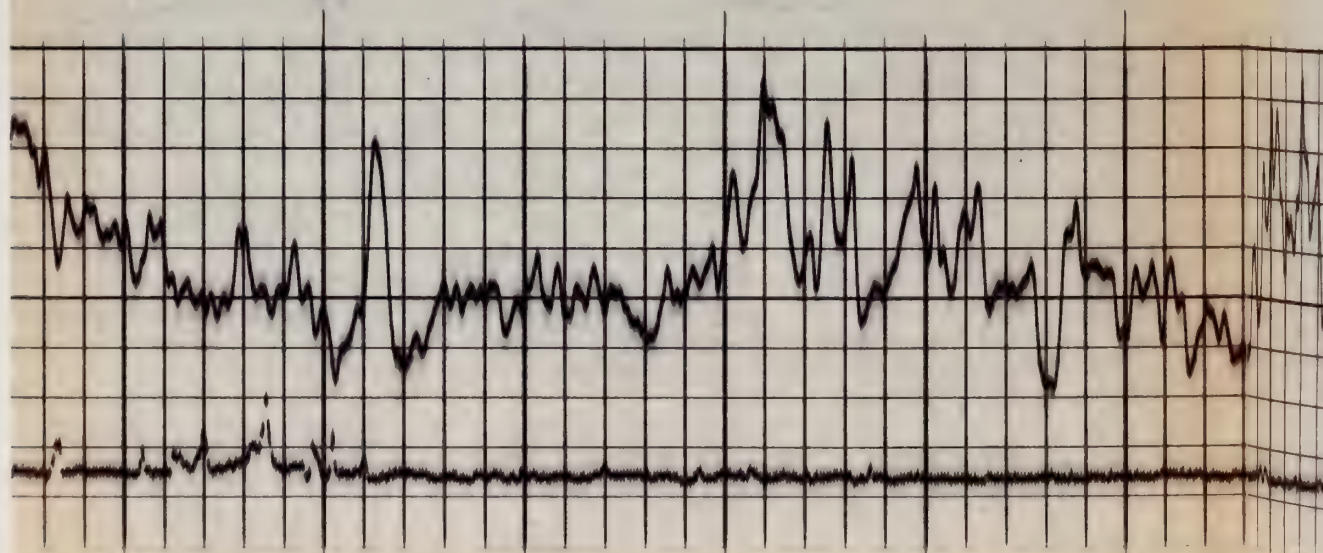


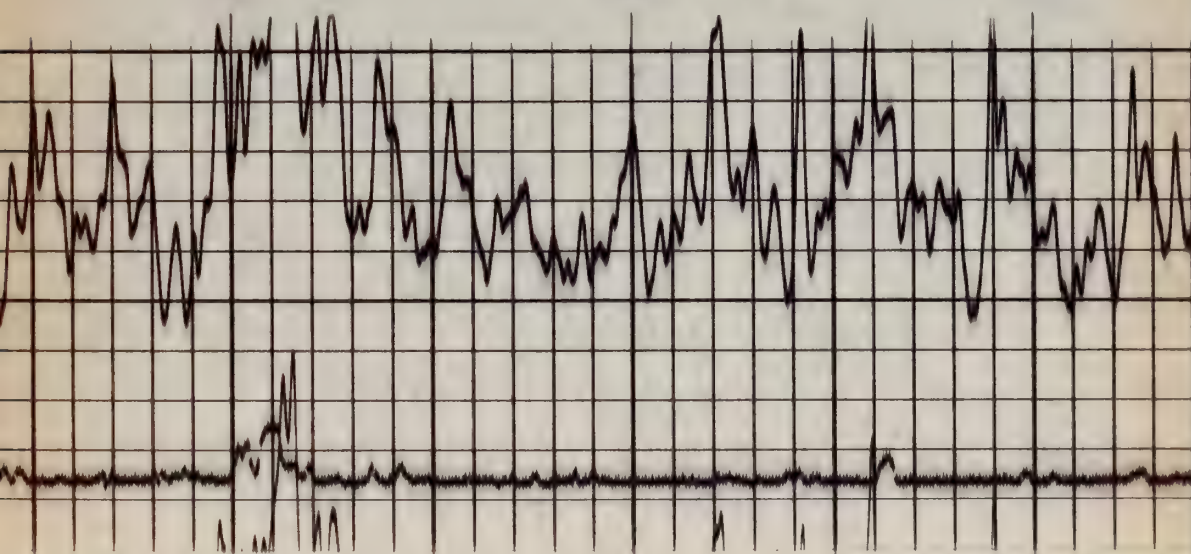
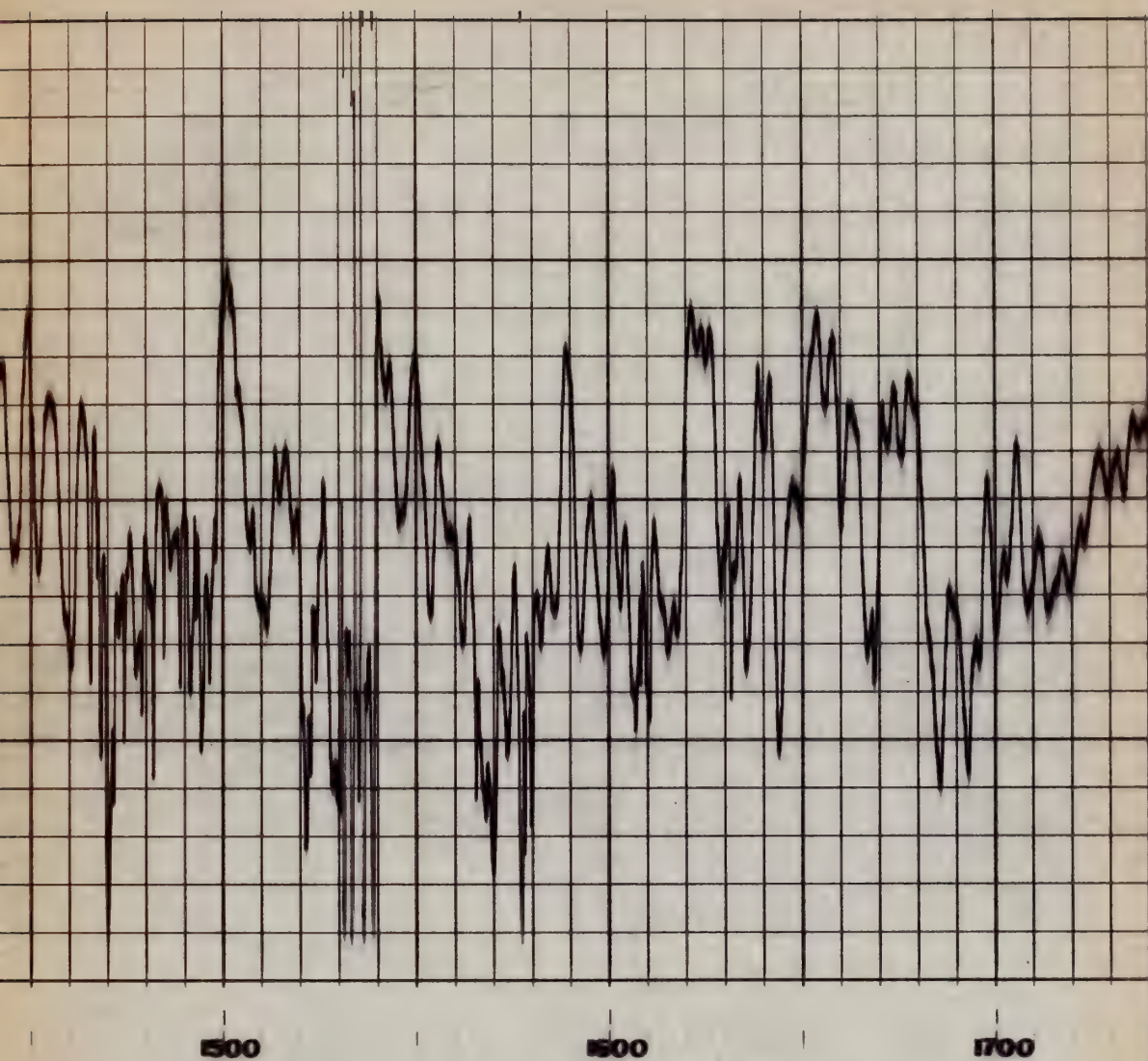


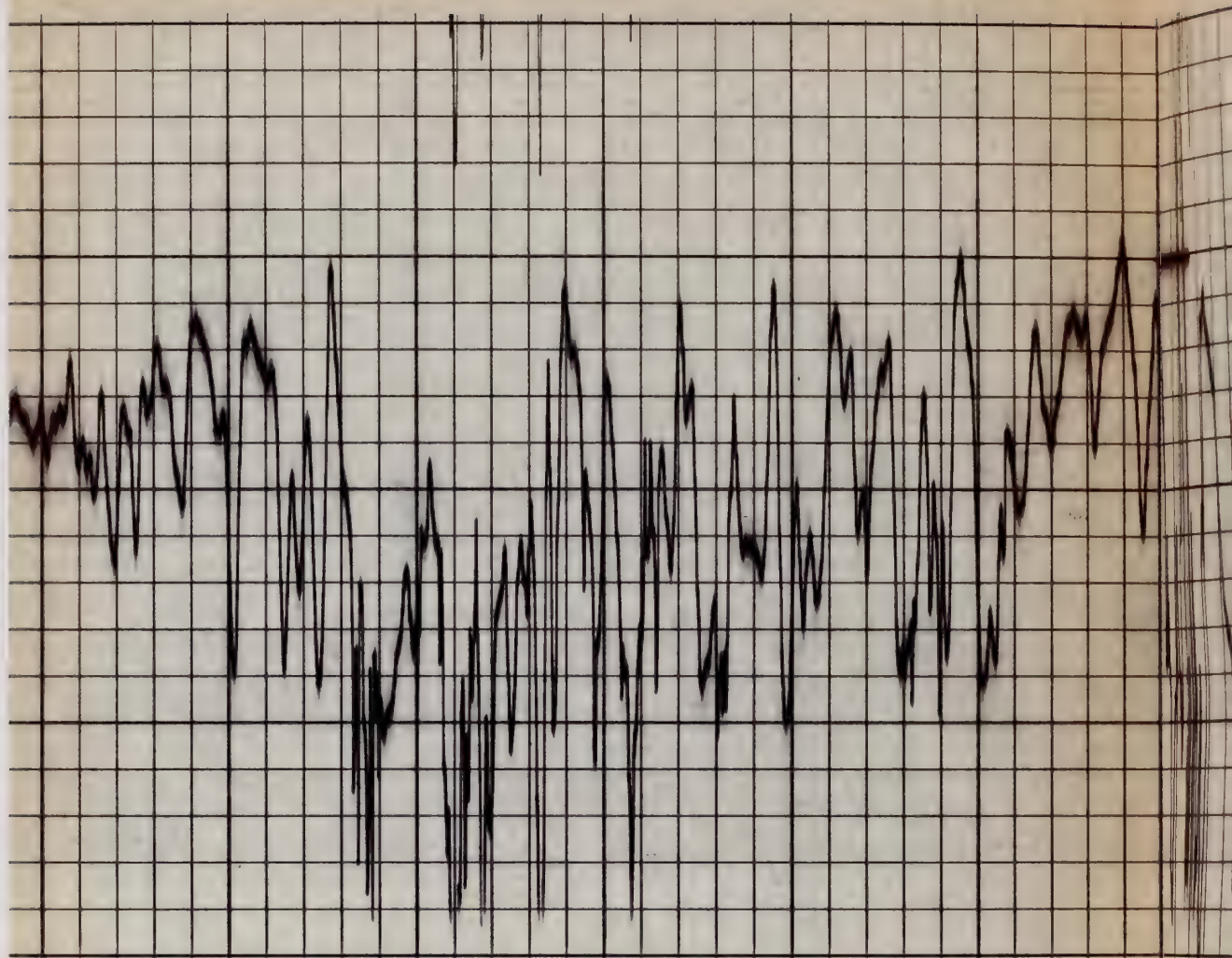
200

300

400



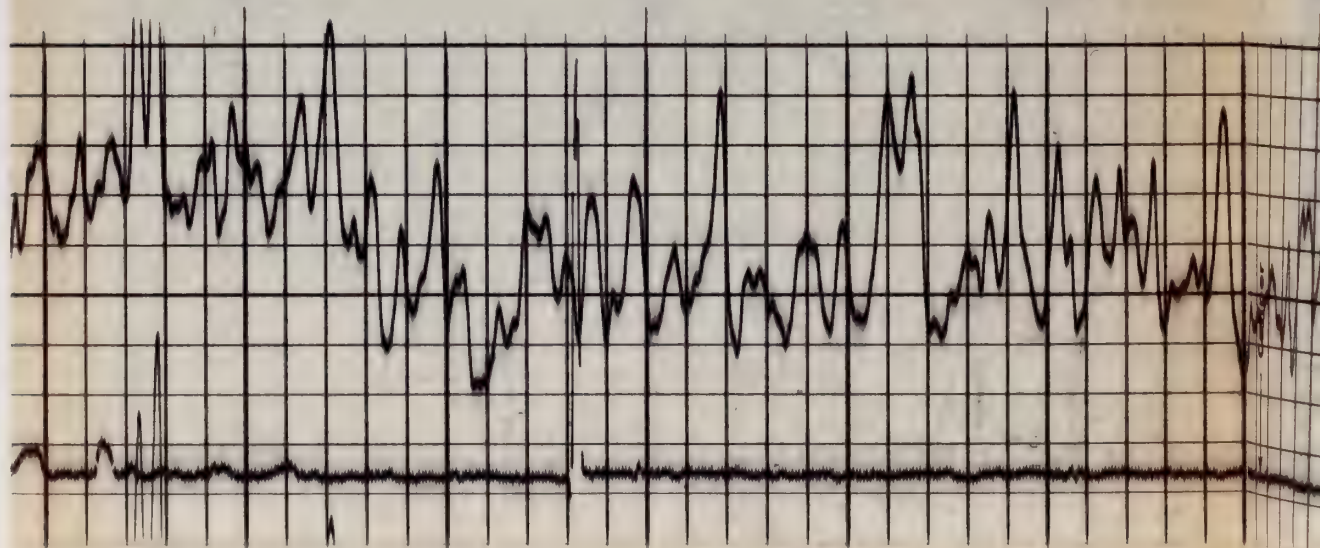


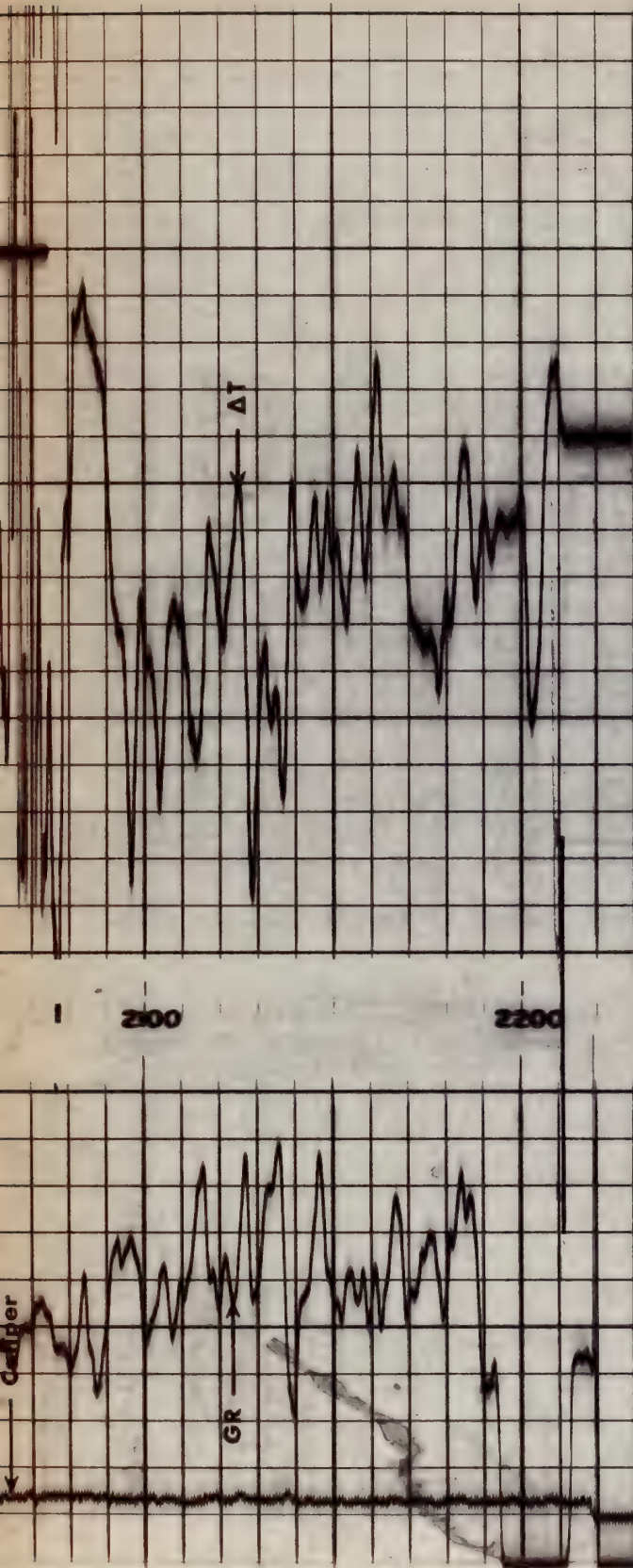


500

500

2000





DETAIL LOG

5'' = 100'

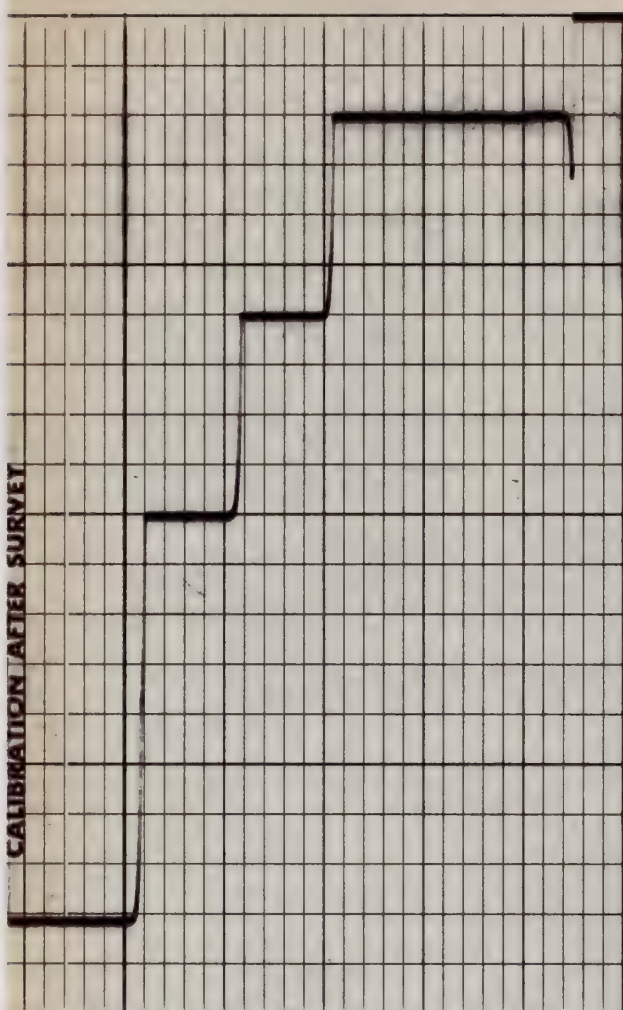
INTERVAL TRANSIT TIME		MICROSECONDS PER FOOT		T	3	R ₁	2	R ₂
150	250	100	200					50
								150

DEPTH

CALIPER	DIAM. IN INCHES
5	15

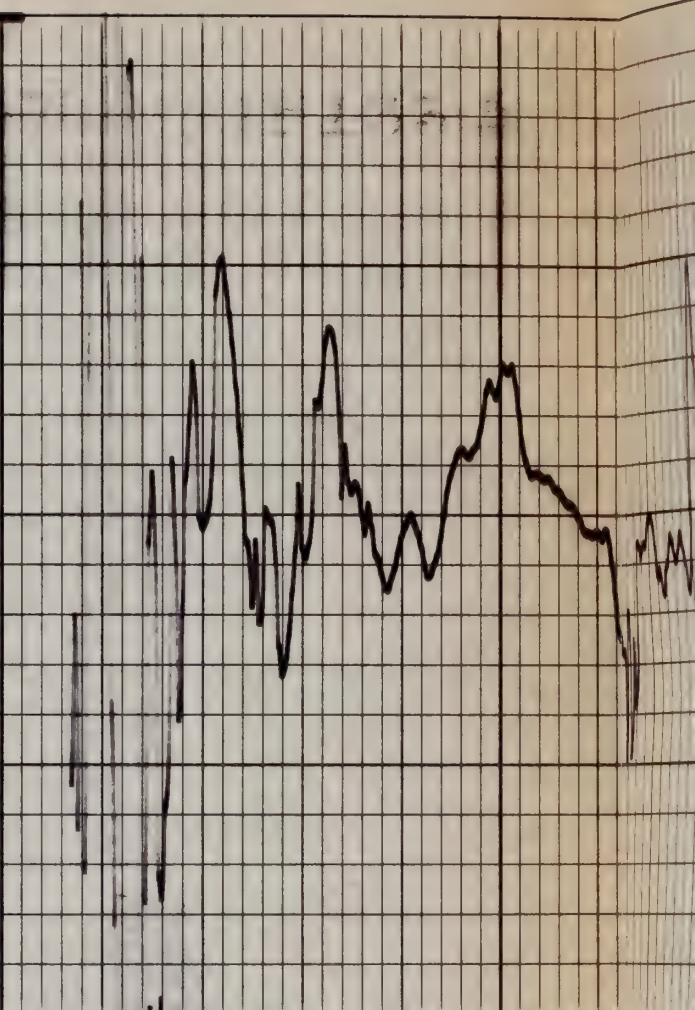
GAMMA RAY	API UNITS
0	150
150	300

CALIBRATION AFTER SURVEY

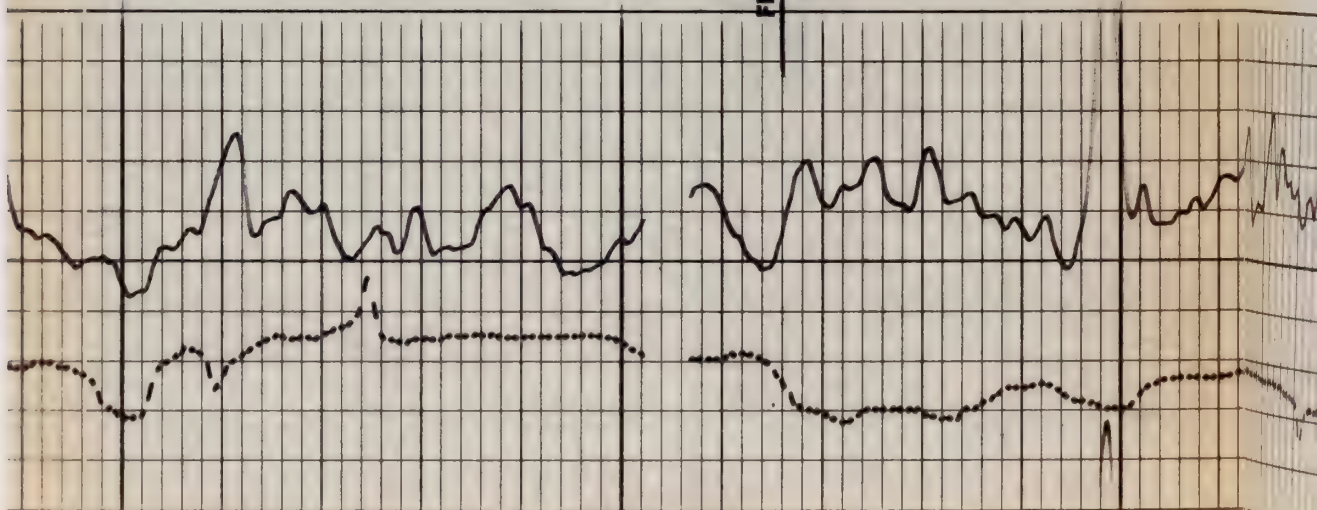


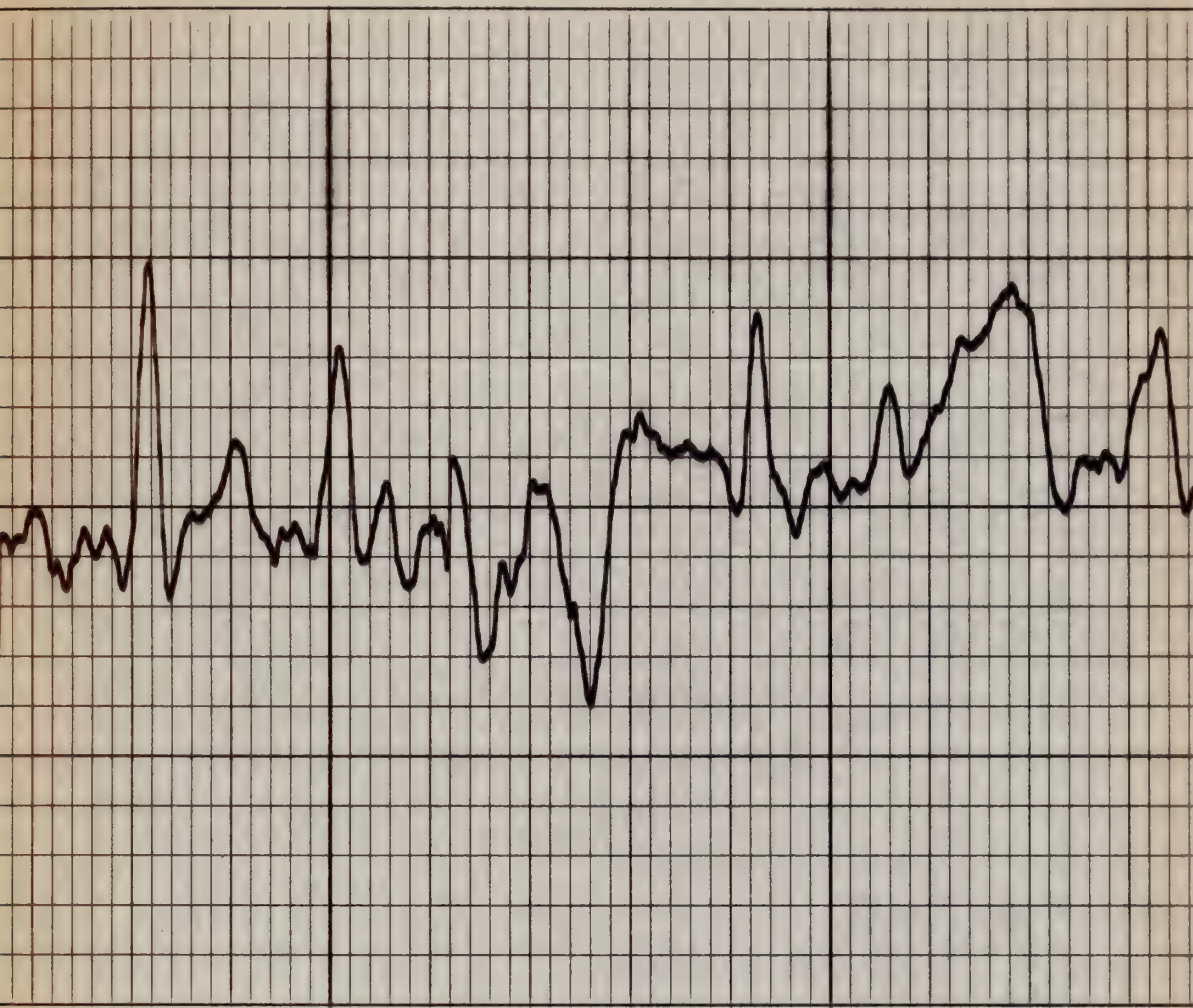
0400

FLUID LEVEL

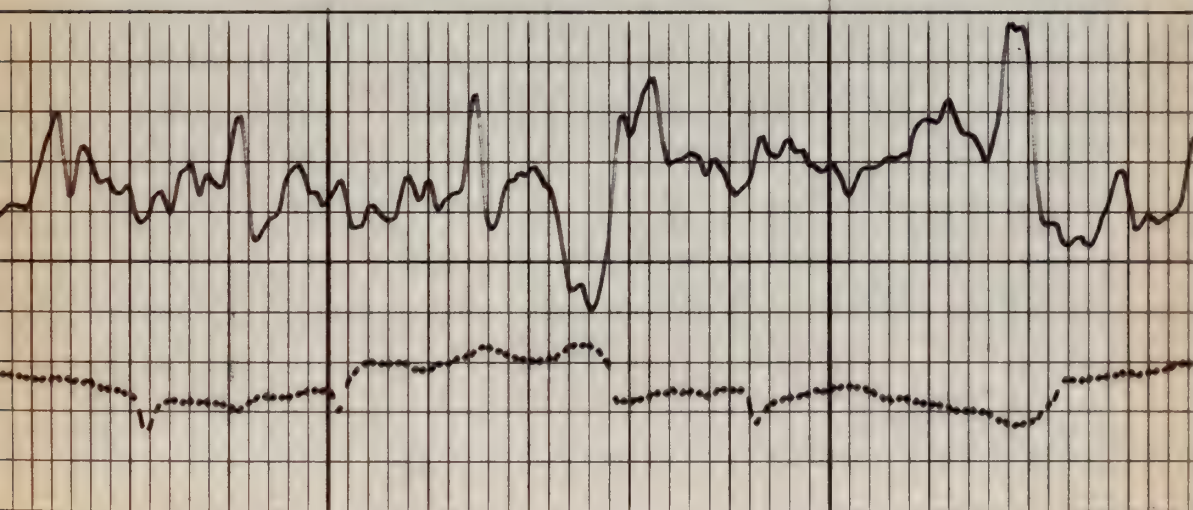


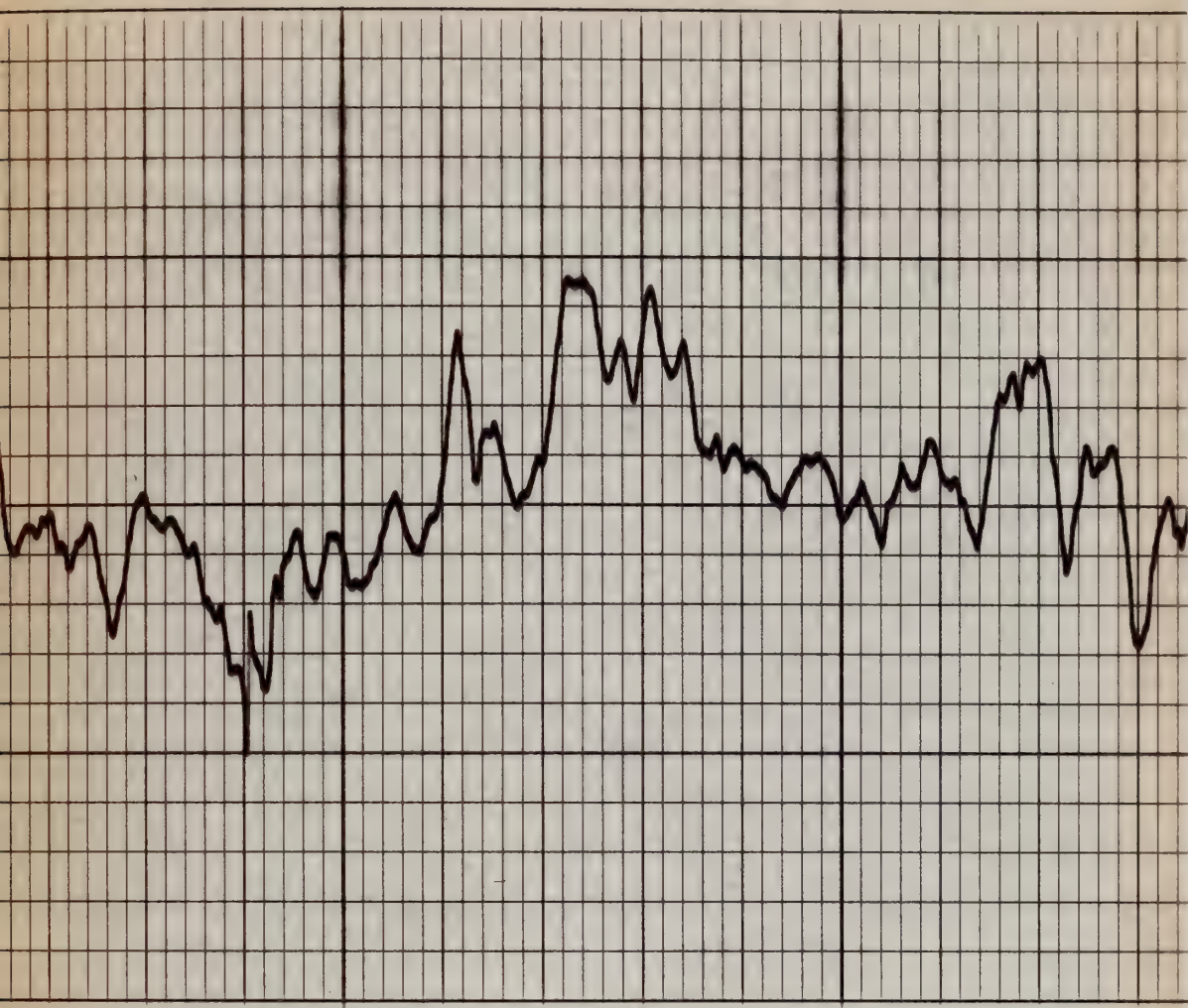
0500



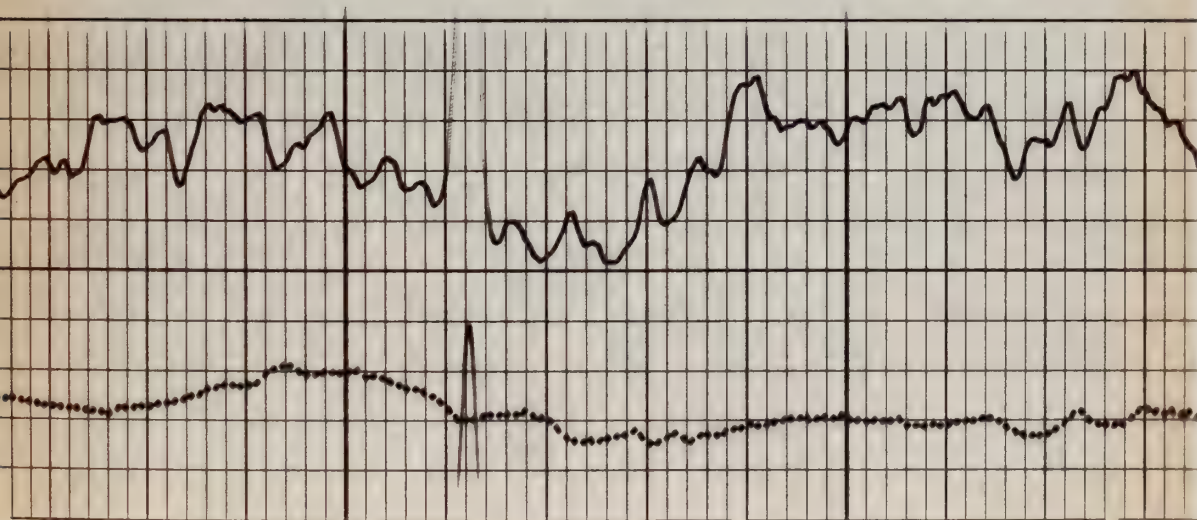


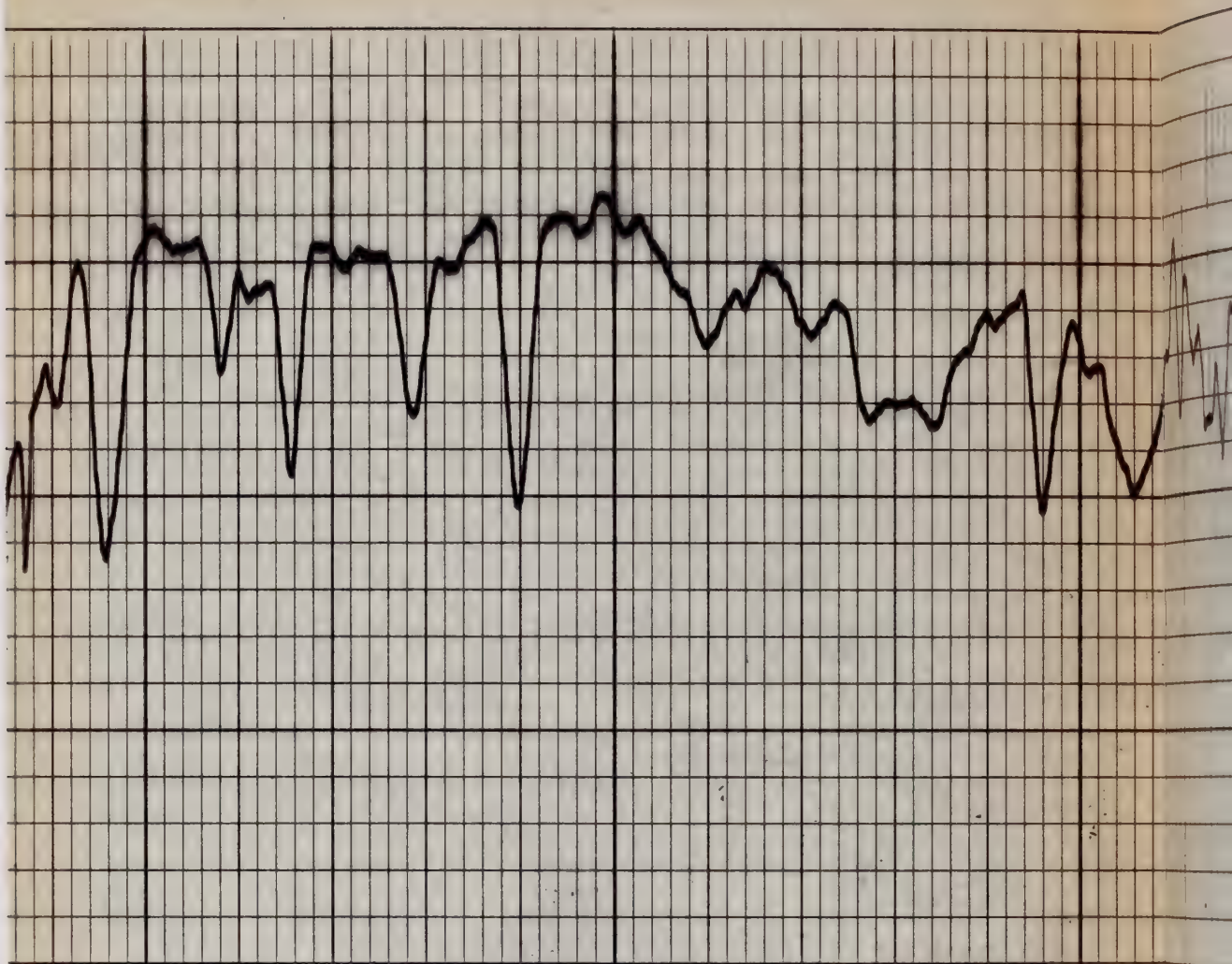
0600





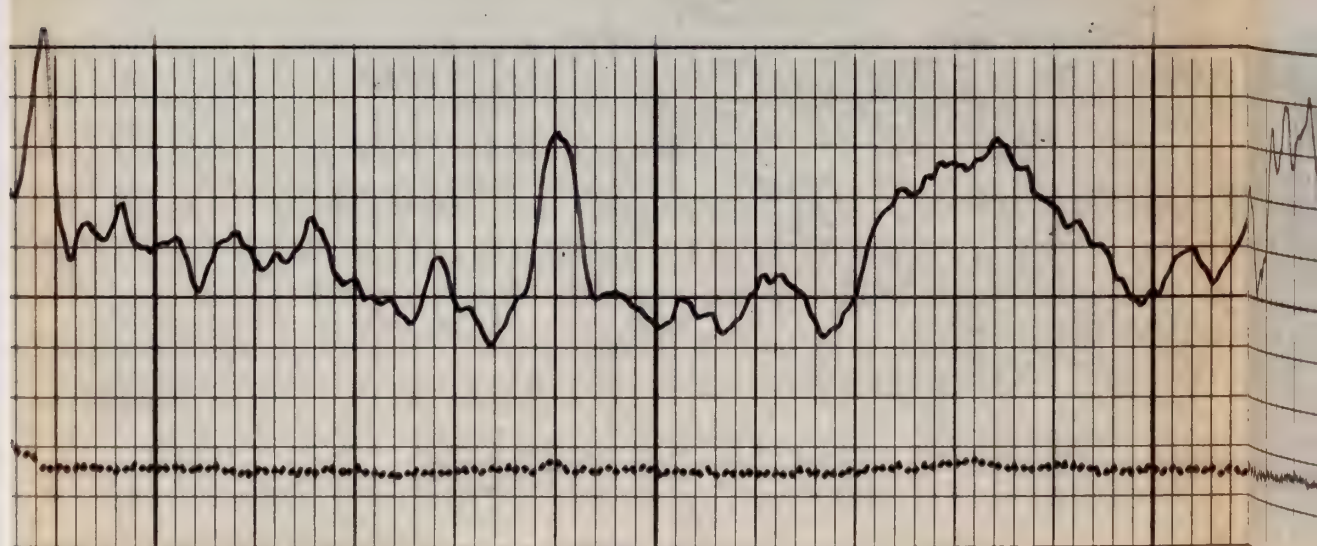
0800

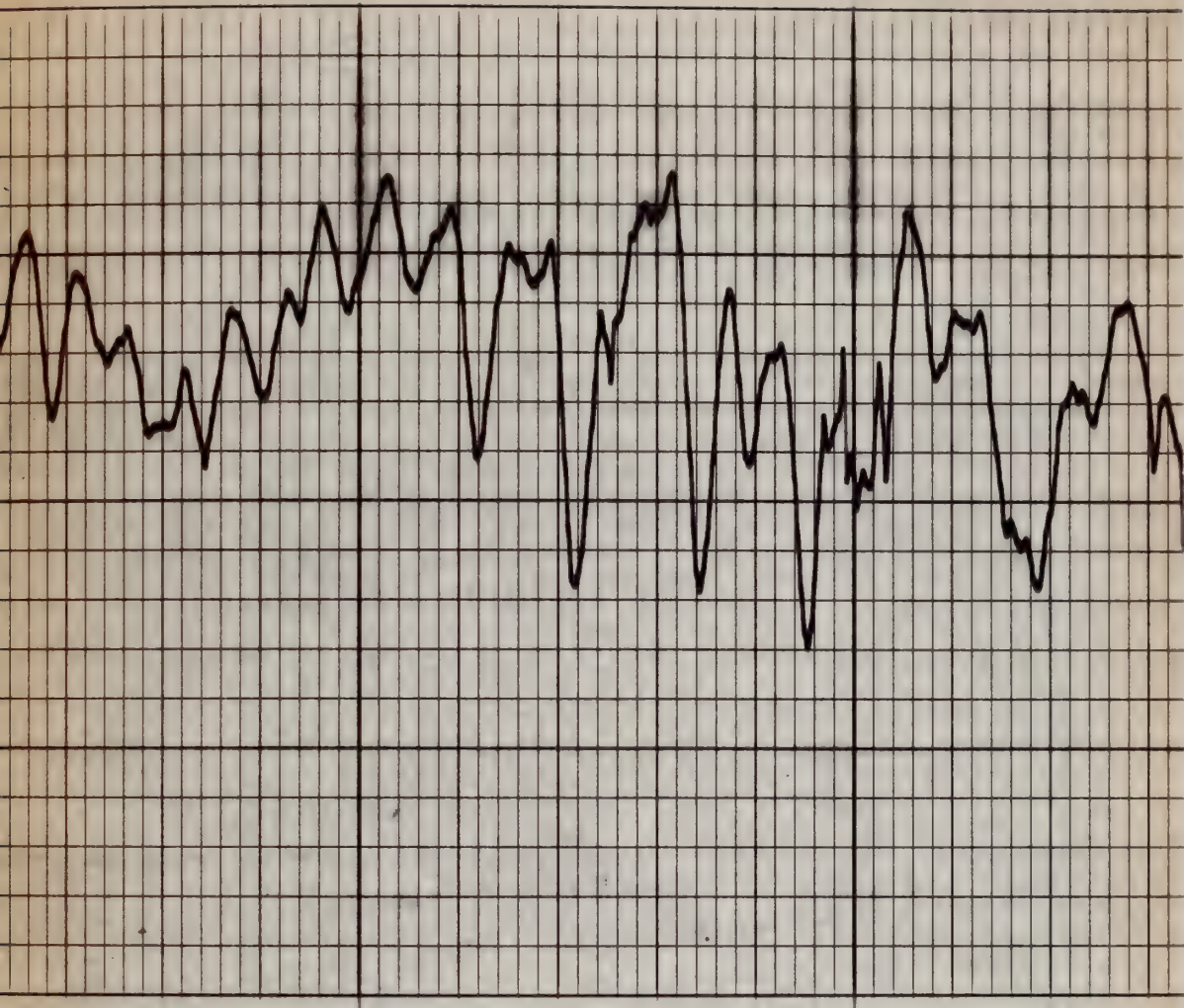




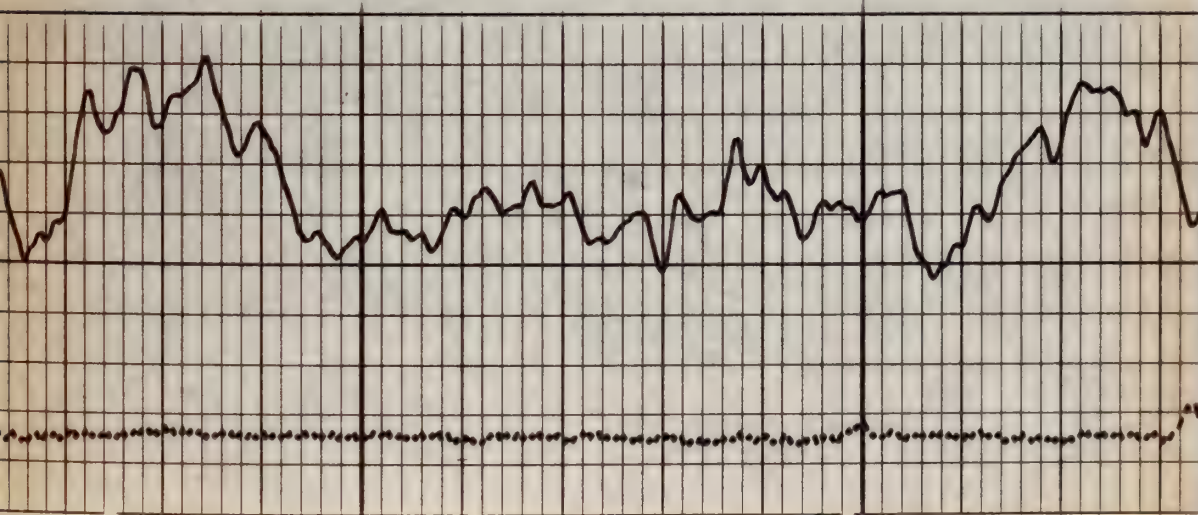
0900

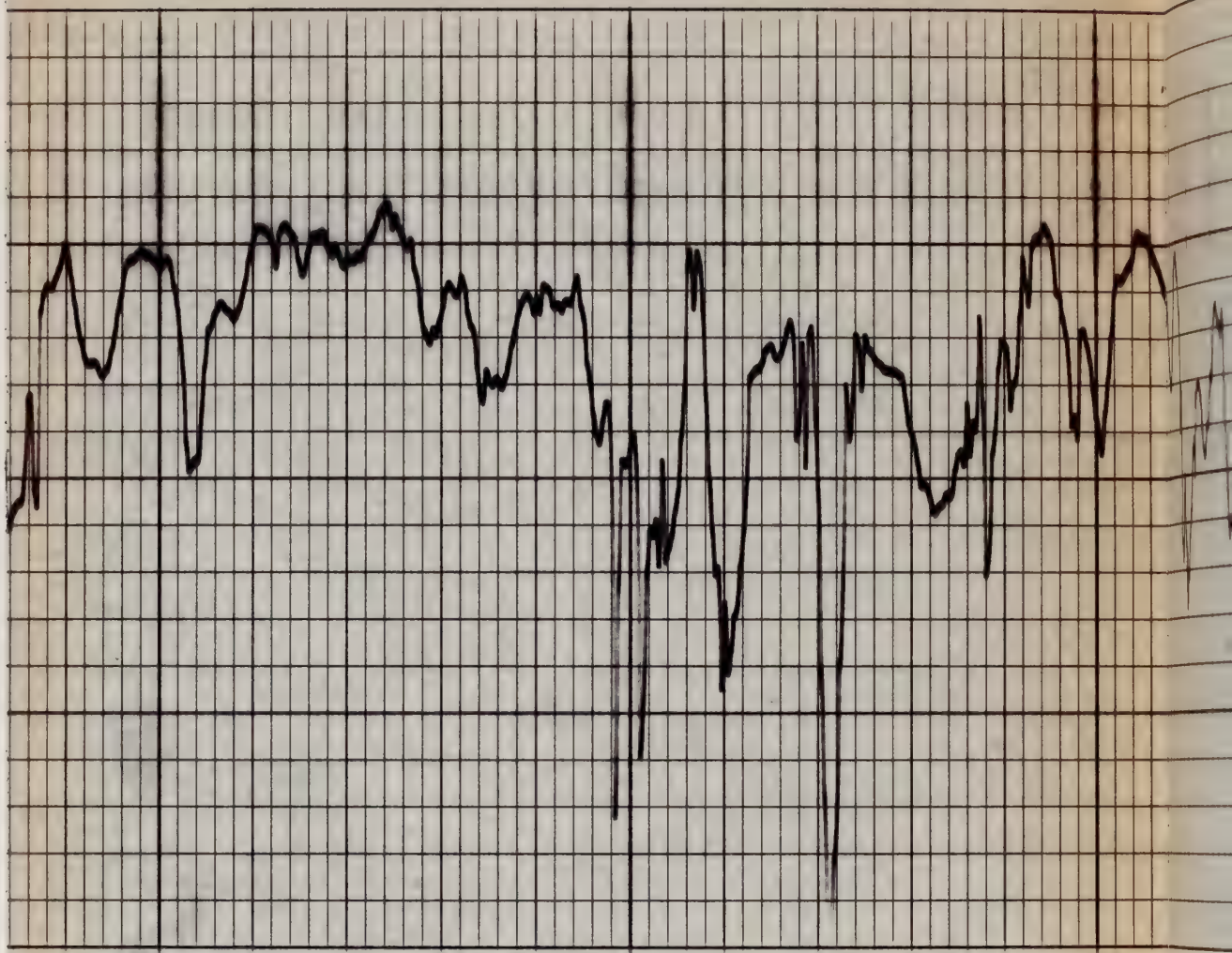
1000



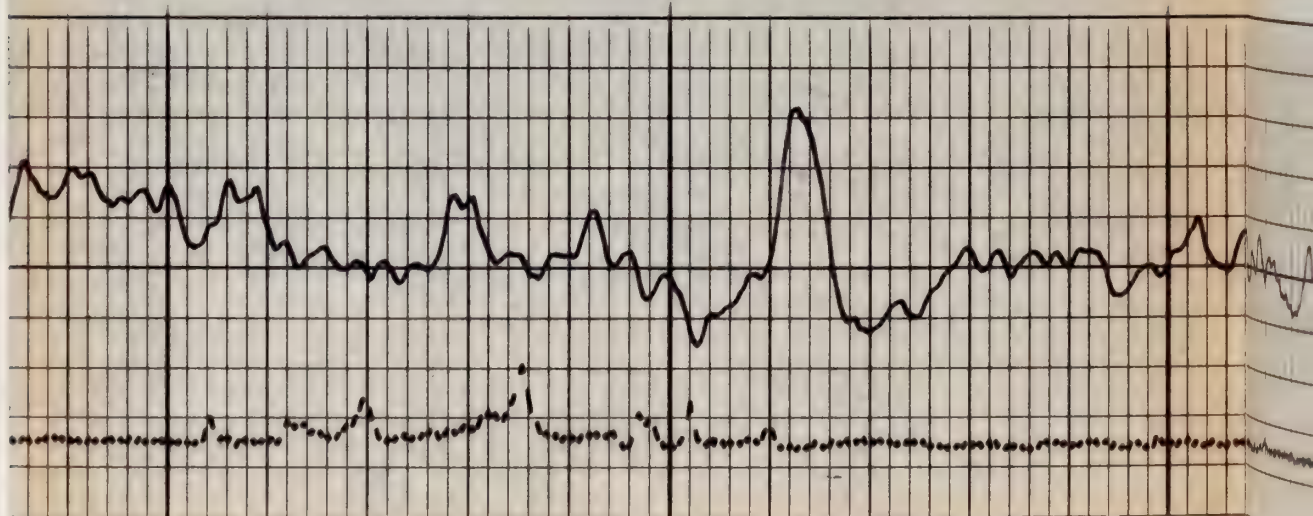


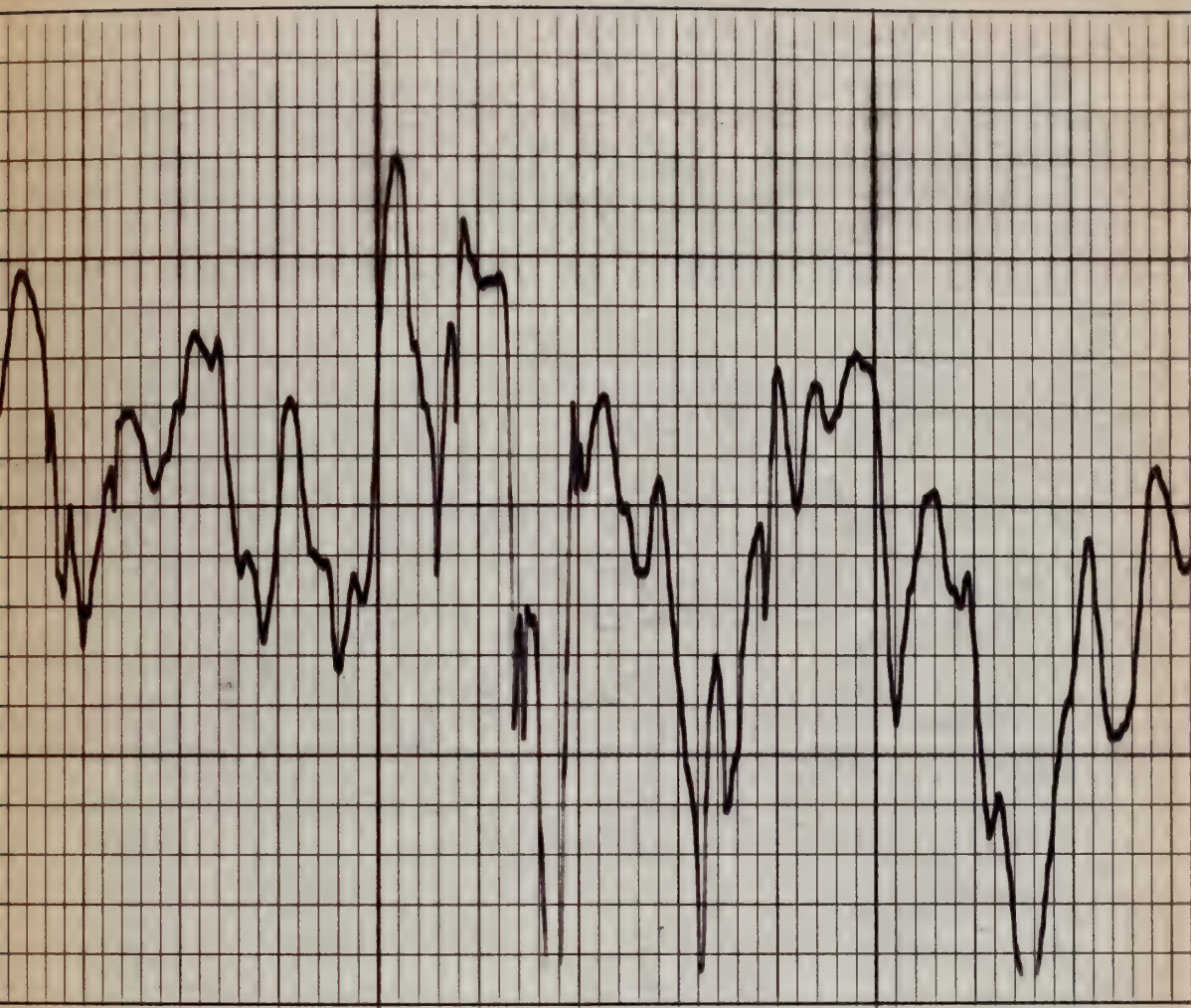
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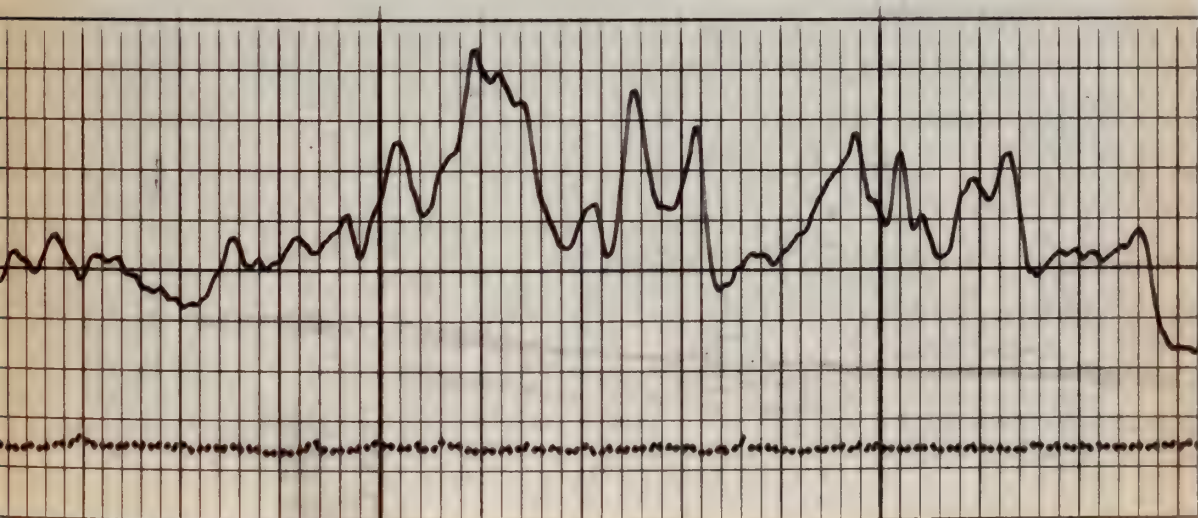


200

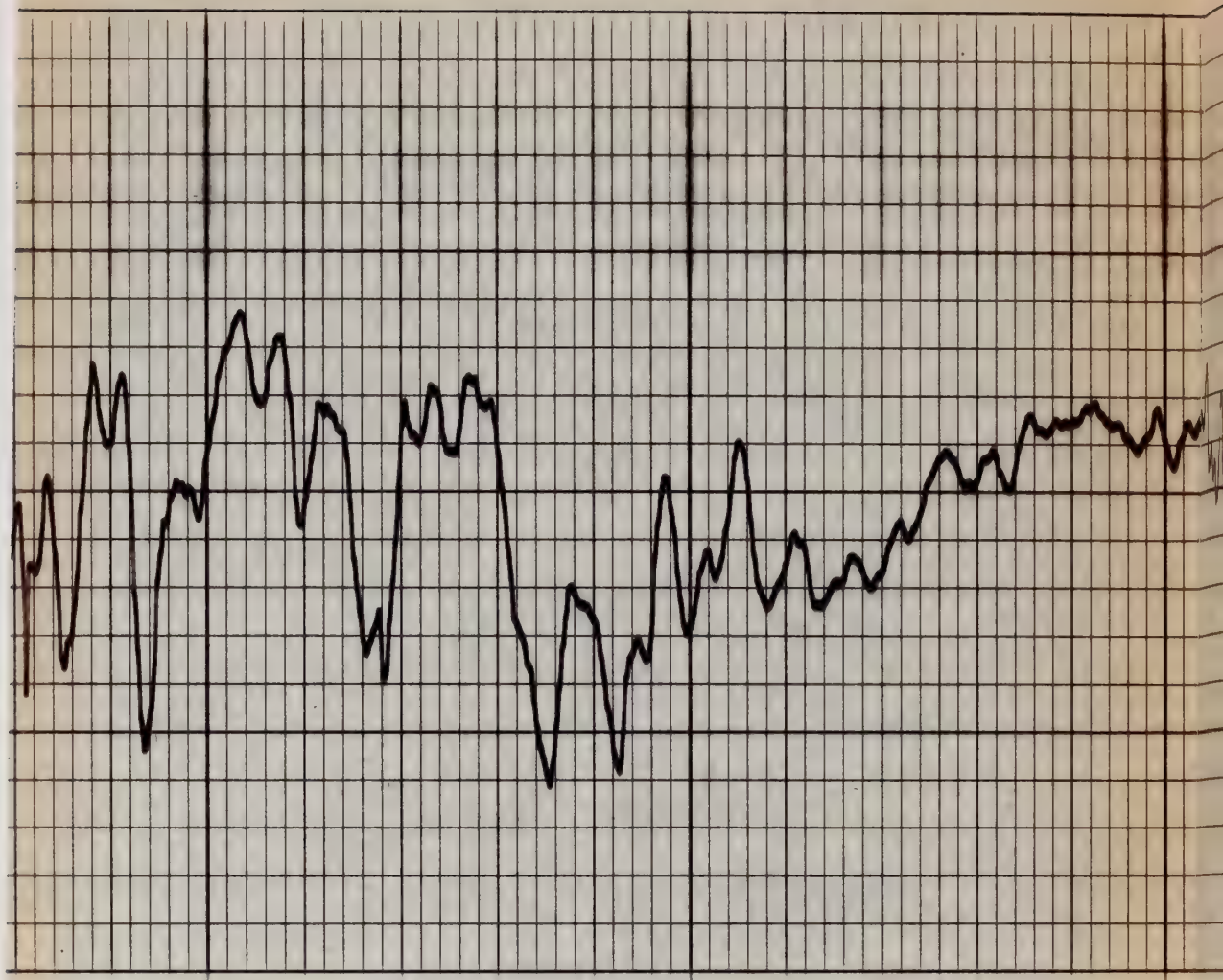




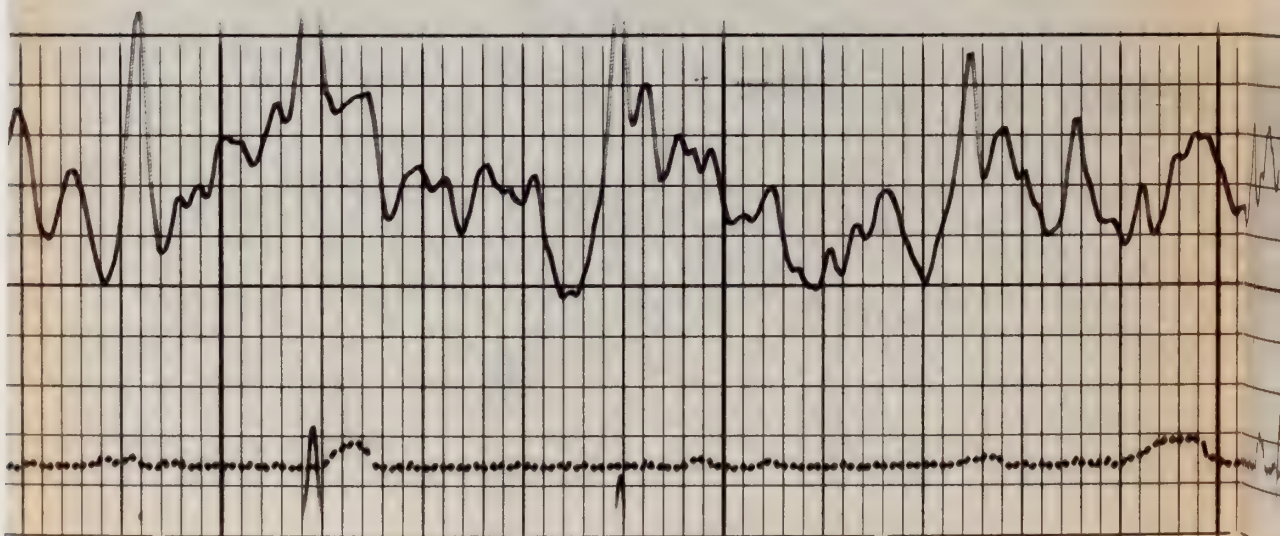
B00

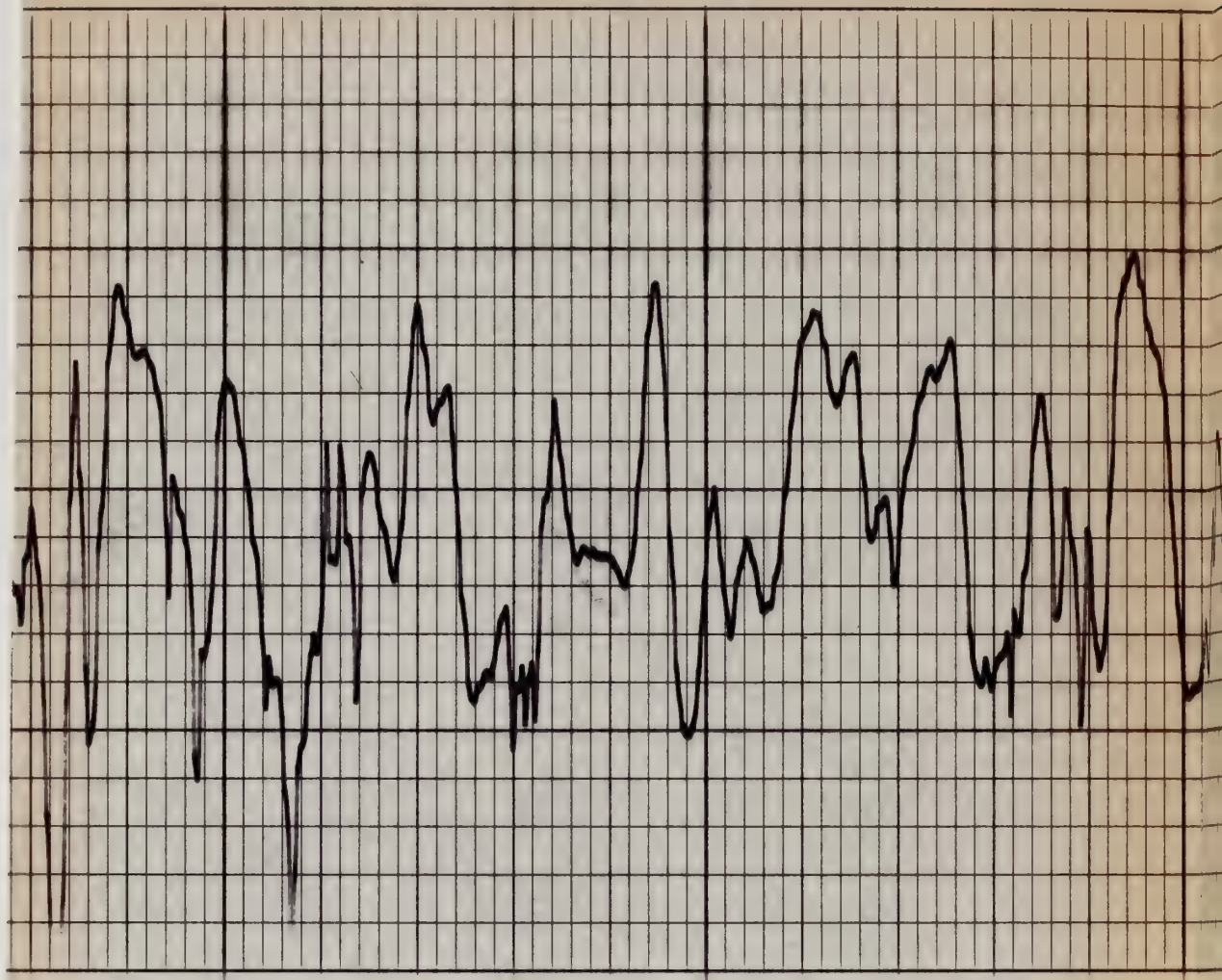






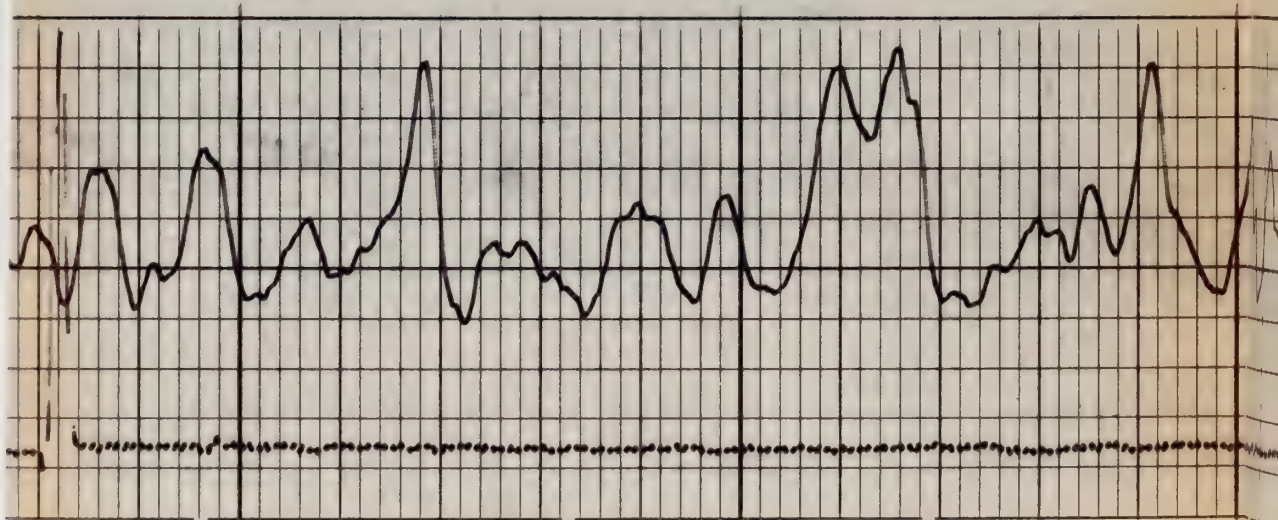
1700

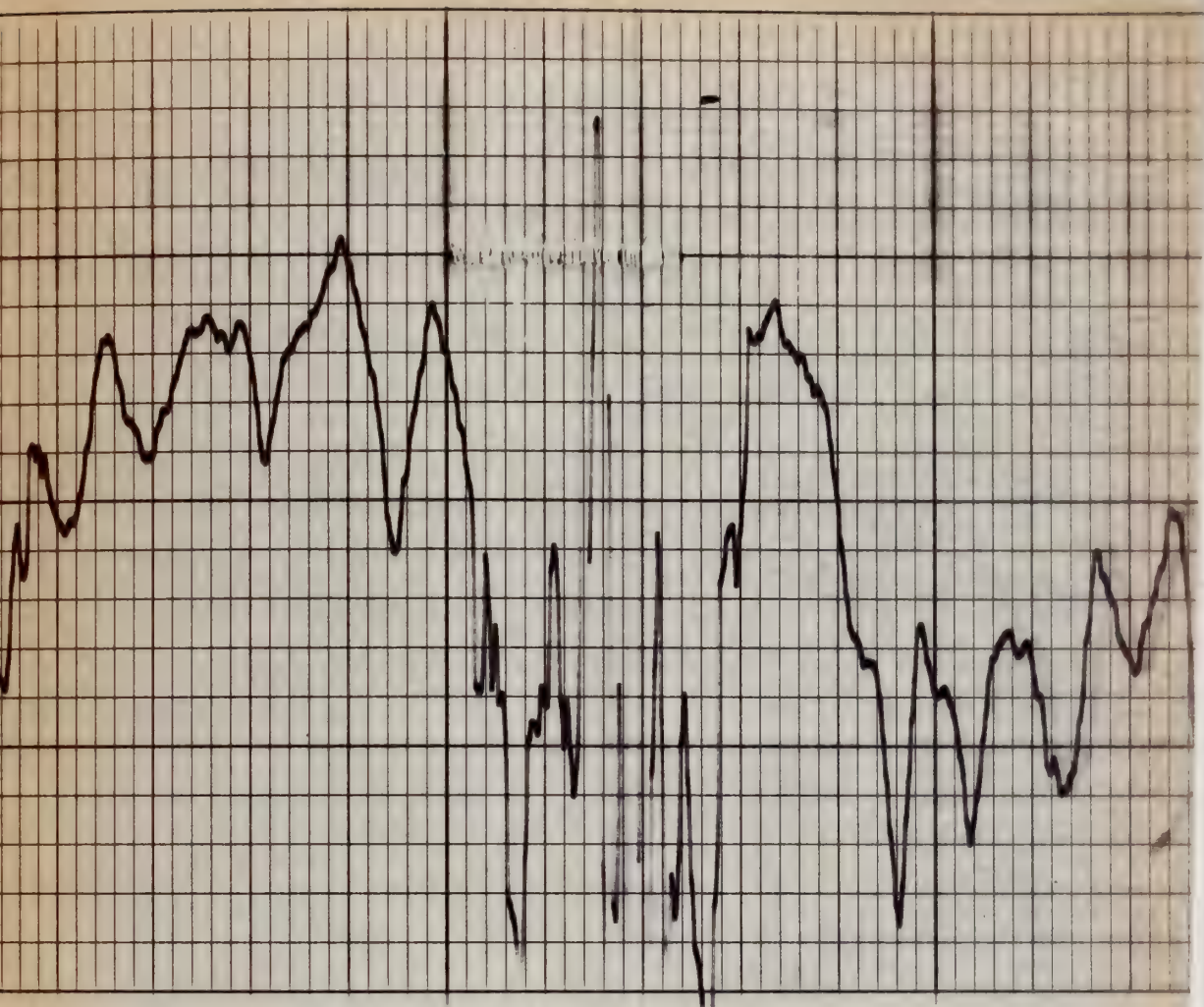




1900

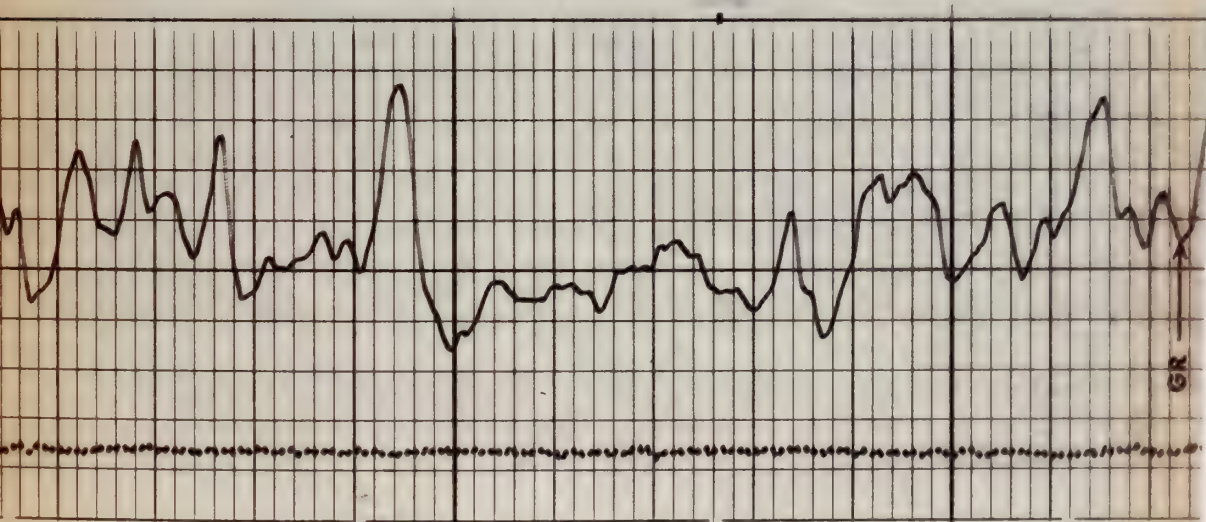
2000



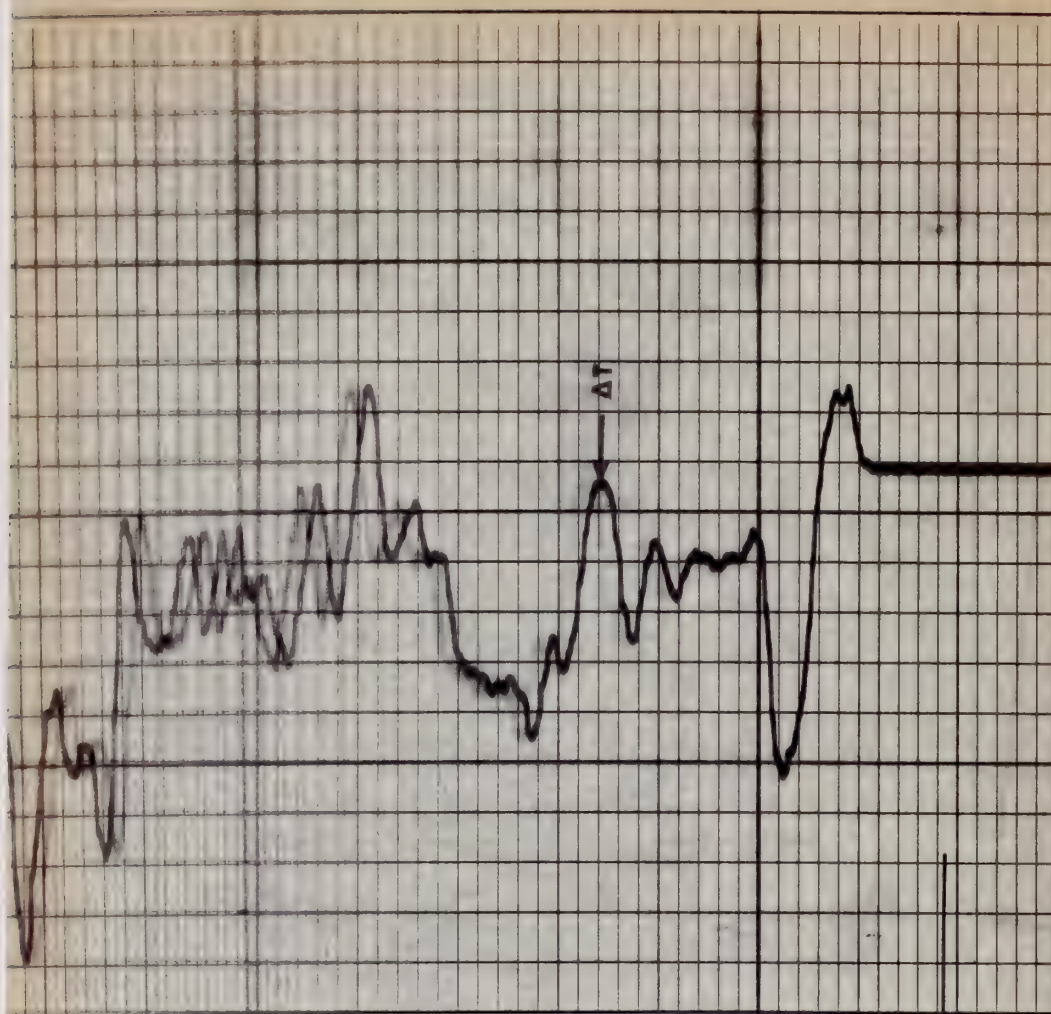


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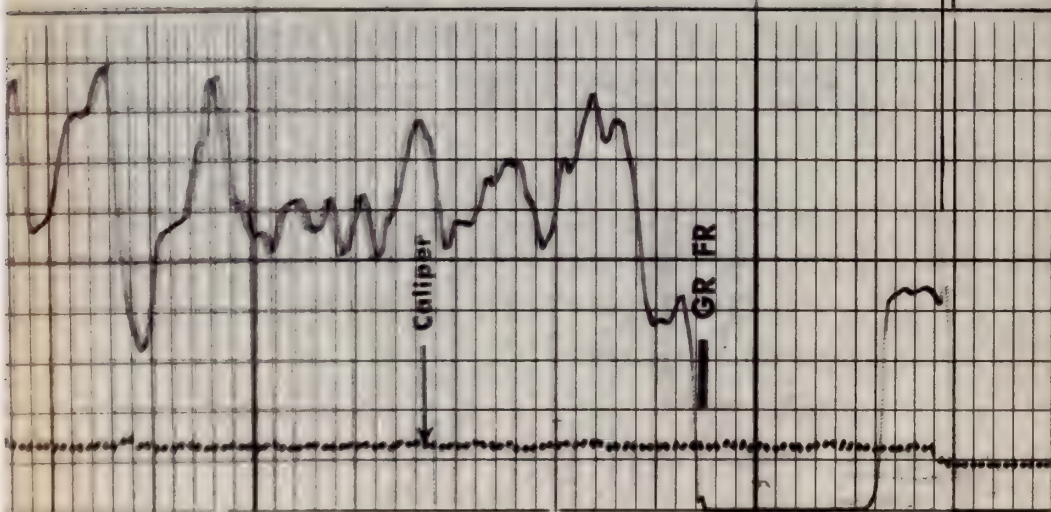
2100



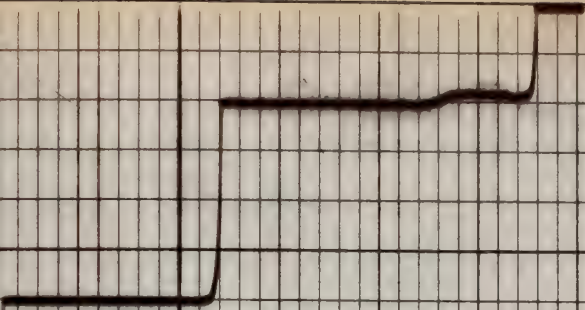
GR



2200



CALIBRATION BEFORE SURVEY

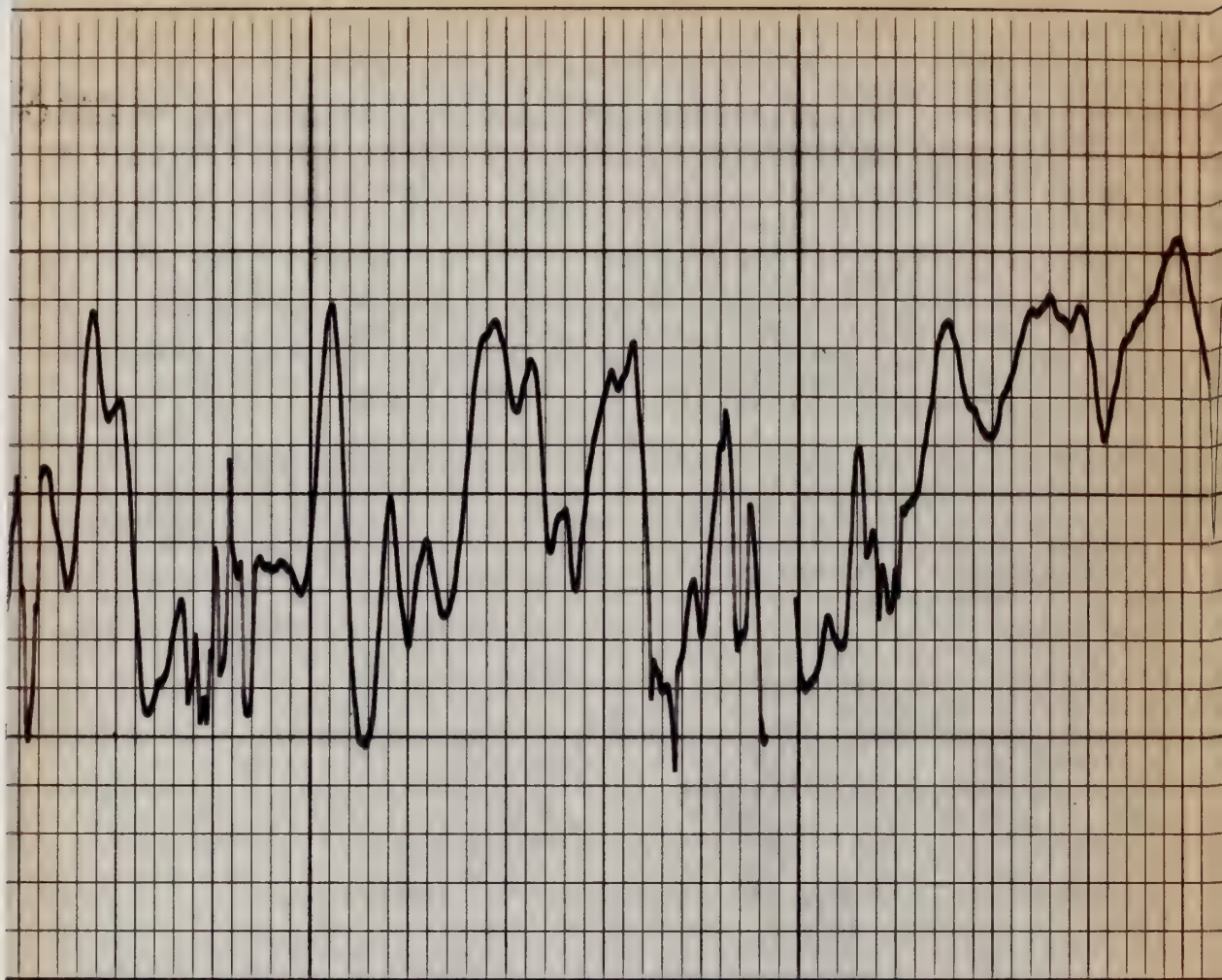


REPEAT SECTION

1900

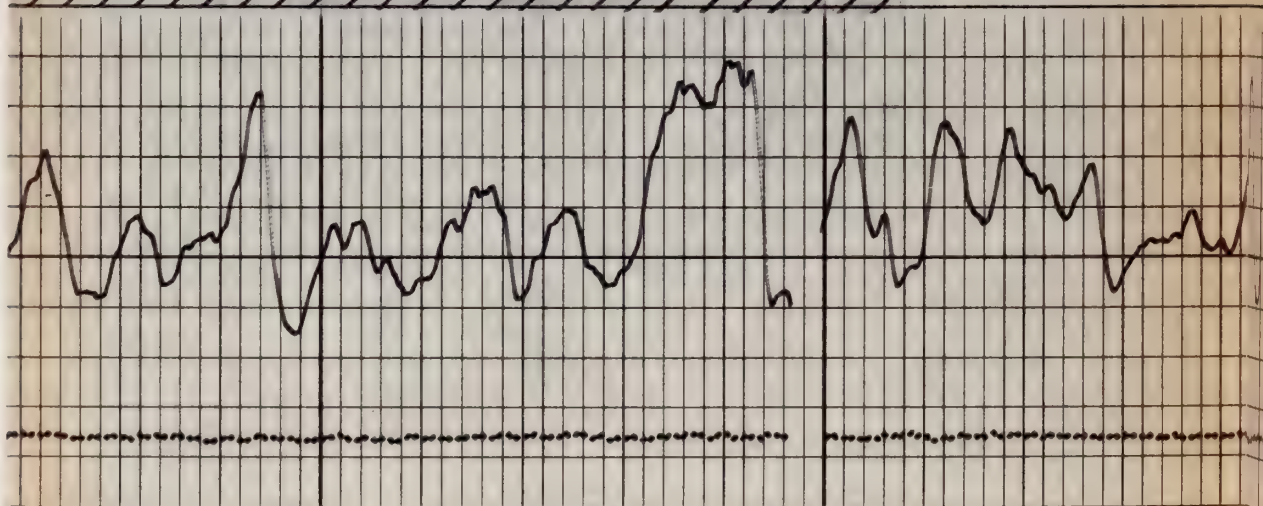
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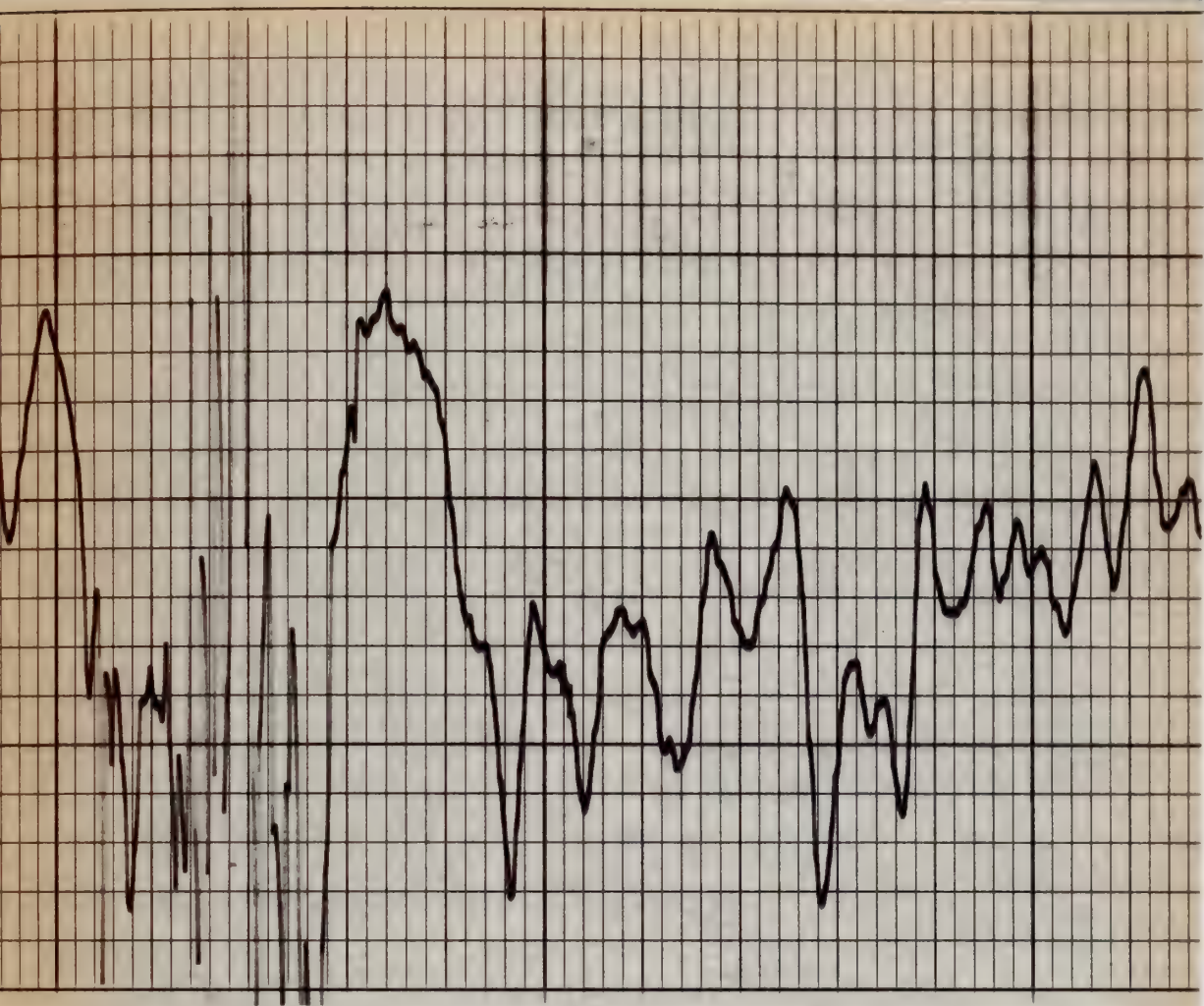




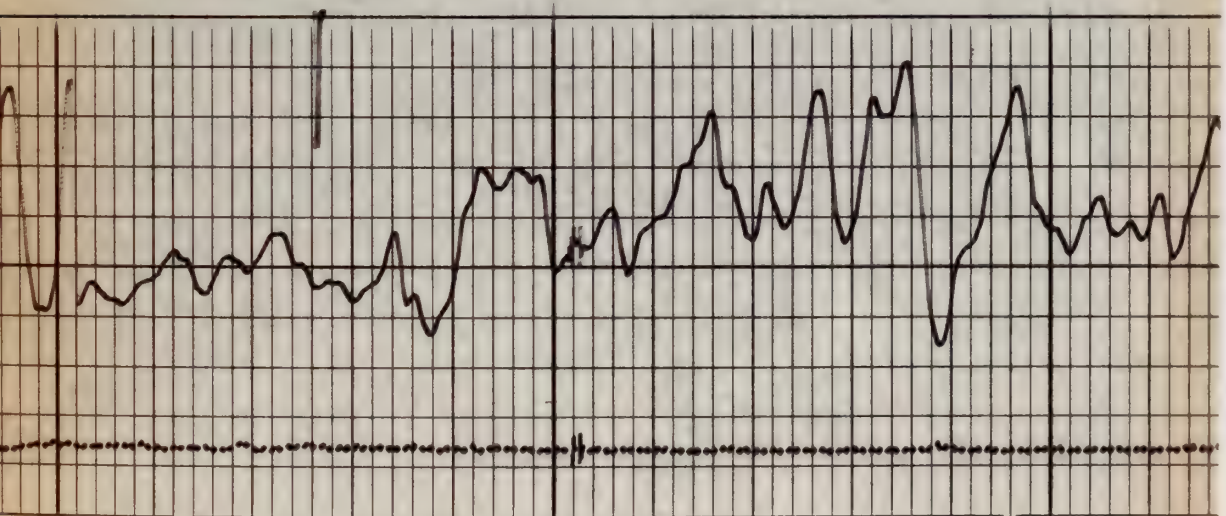
MORIZER OUT — CURVES INVALID

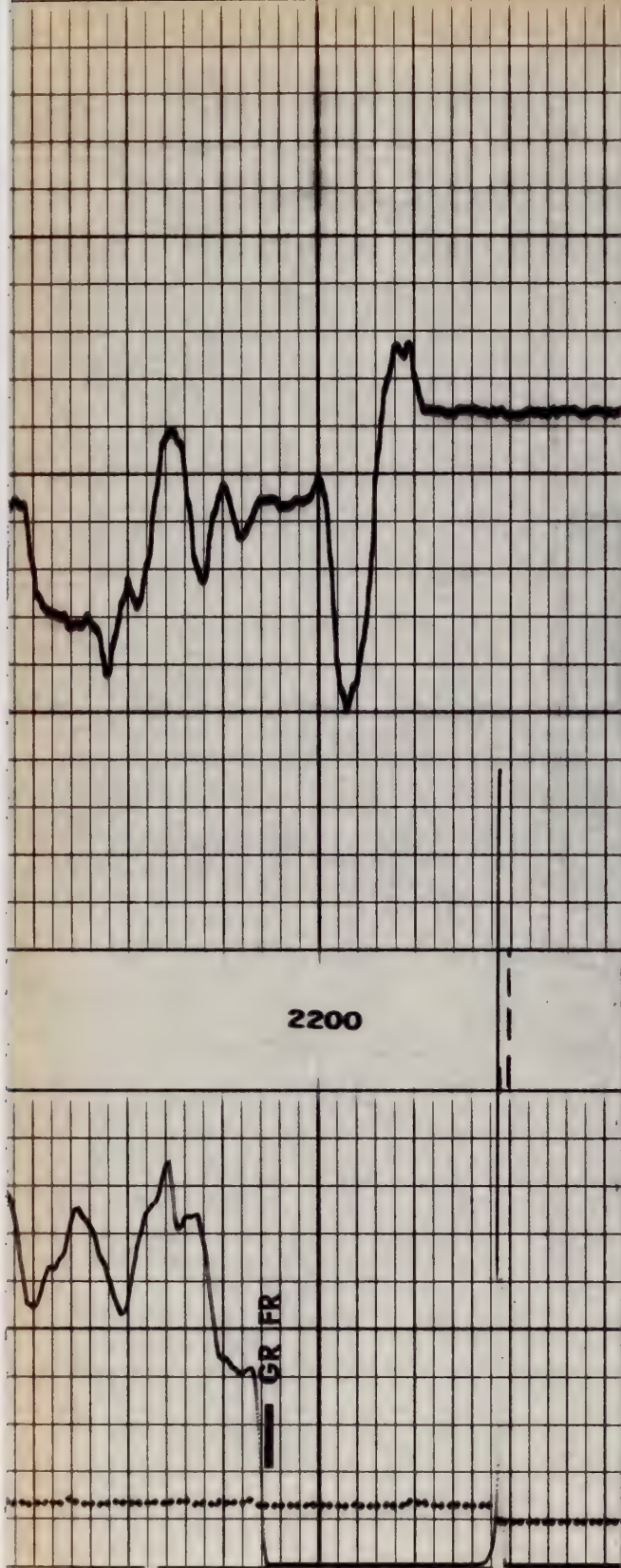
2800





2100





GAMMA RAY API UNITS

CALIPER DIAM. IN INCHES

5 15

INTERVAL TRANSIT TIME

150 250

MICROSECONDS PER FOOT

100 200

T 3 R₁ 2 R₂

50 150

DEPTH

DETAIL LOG

5" = 100'

DEPTH

CALIPER DIAM. IN INCHES

5 15

GAMMA RAY API UNITS

0	150
150	300

AMPLITUDE MILLIVOLTS

0

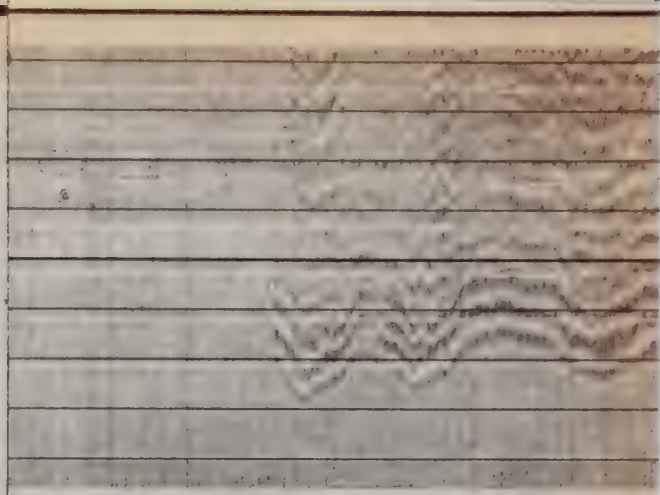
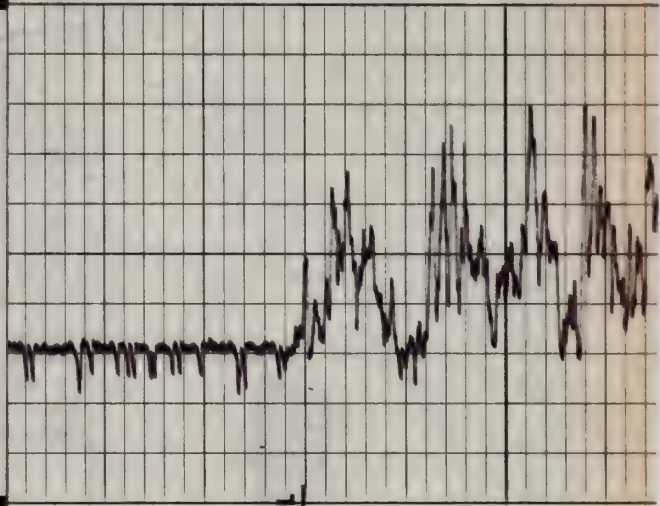
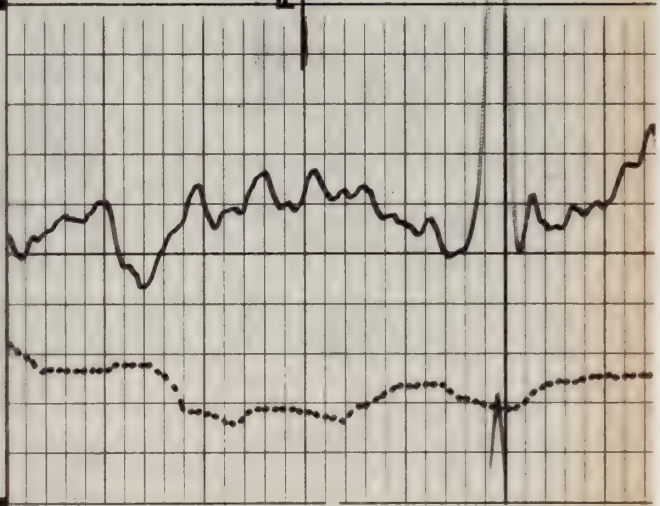
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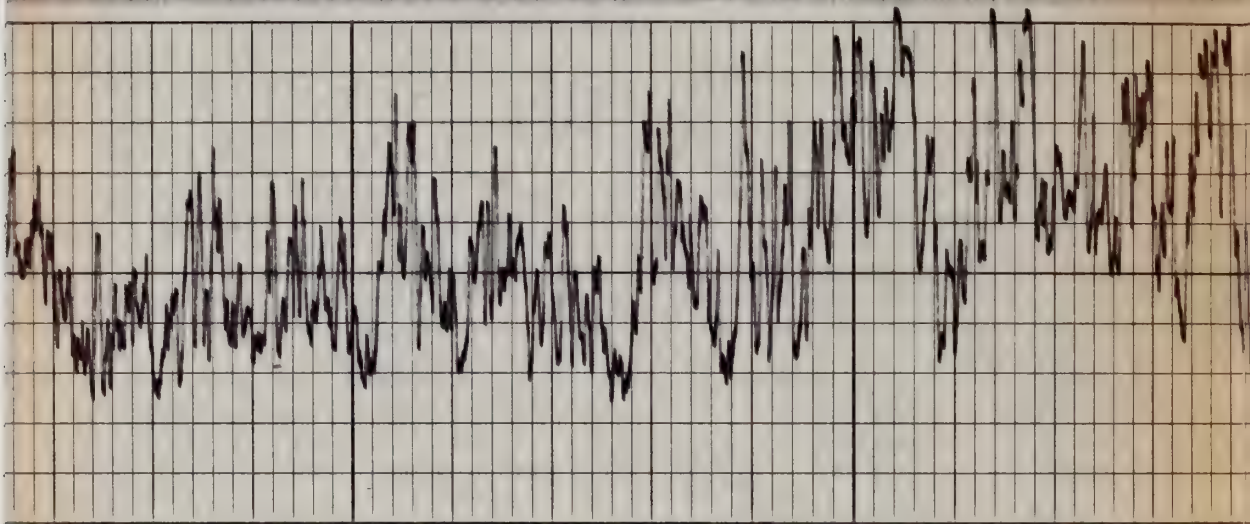
VARIABLE DENSITY
MICROSECONDS

200

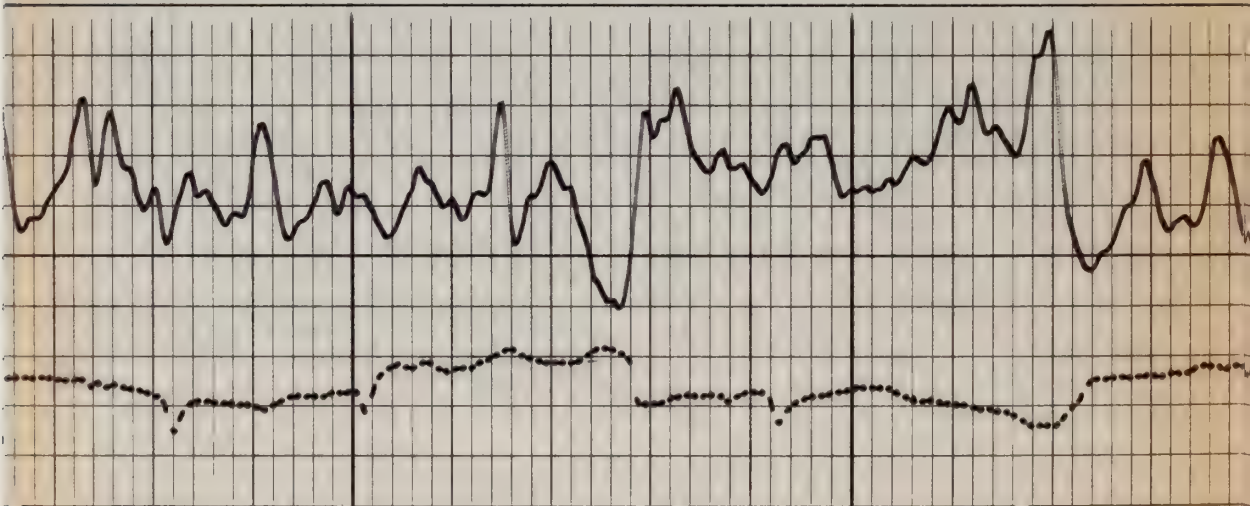
1200

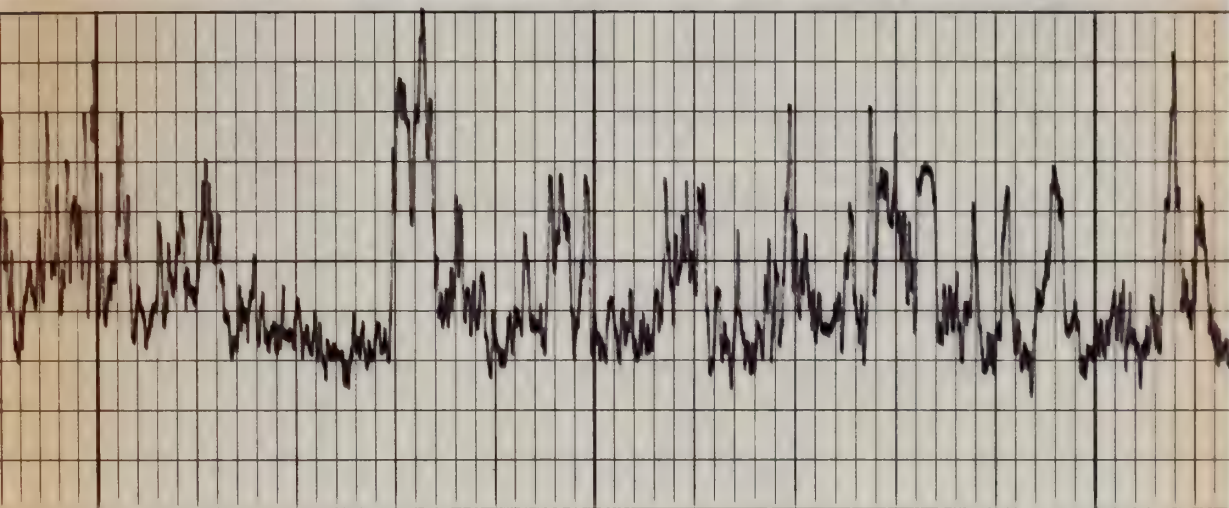
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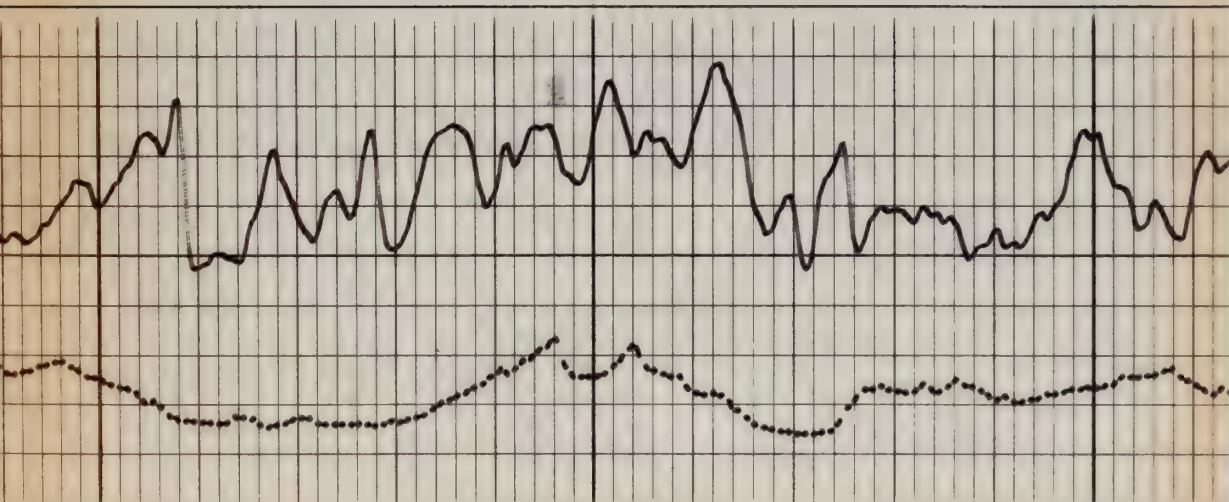


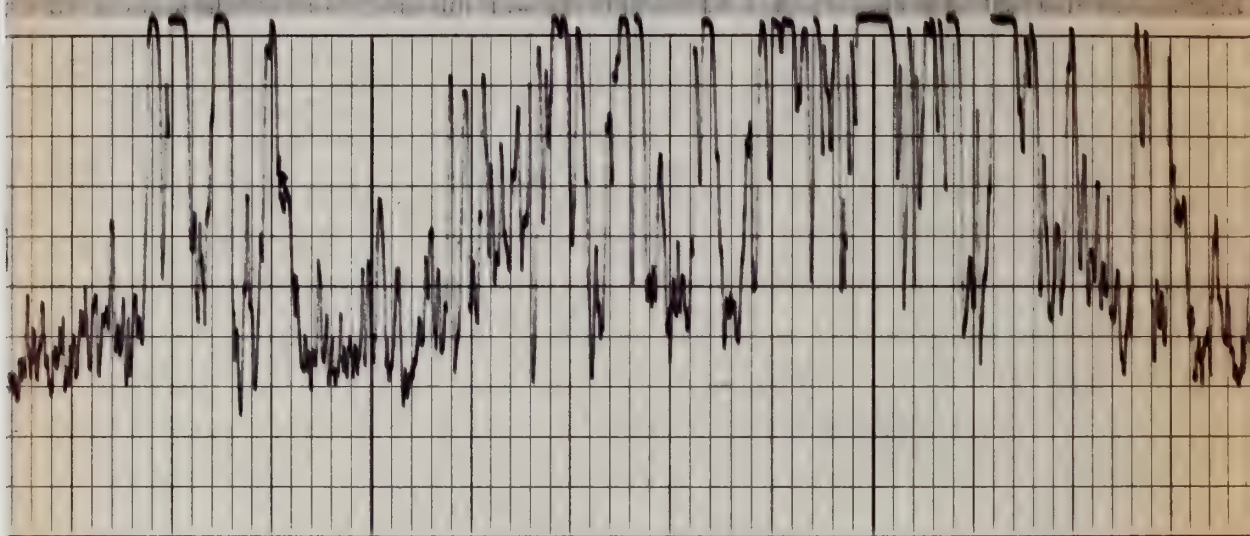
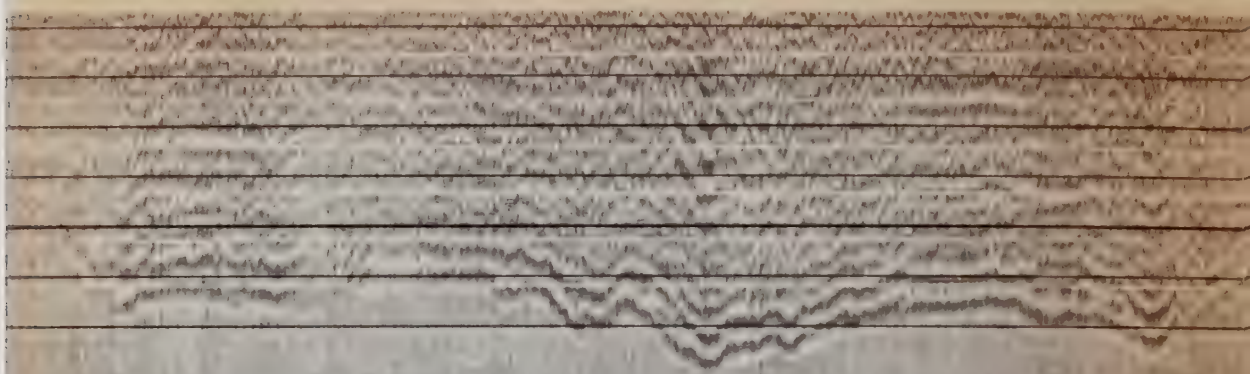
0600



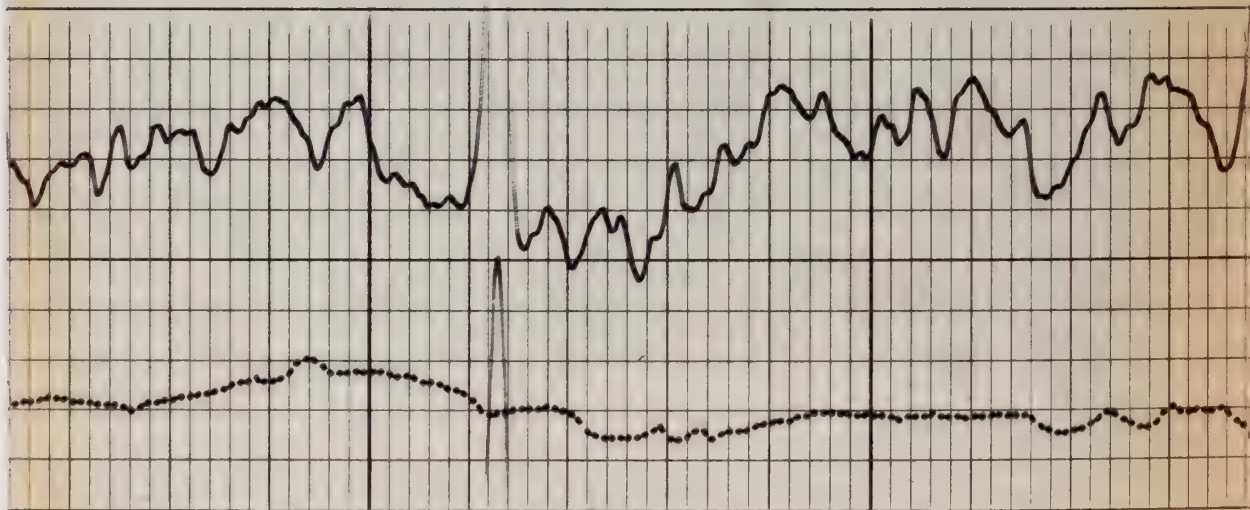


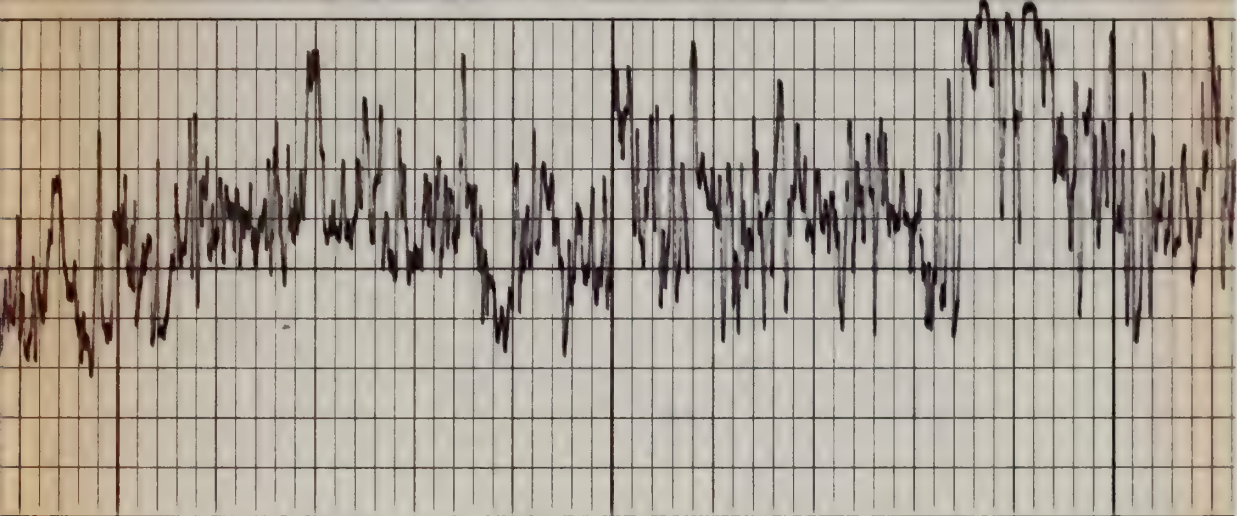
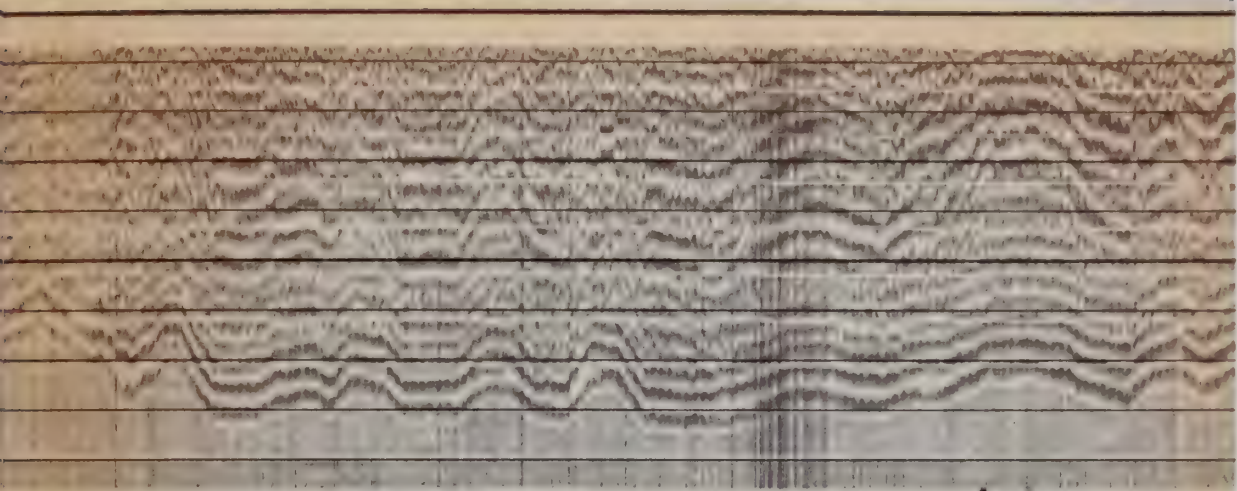
0700





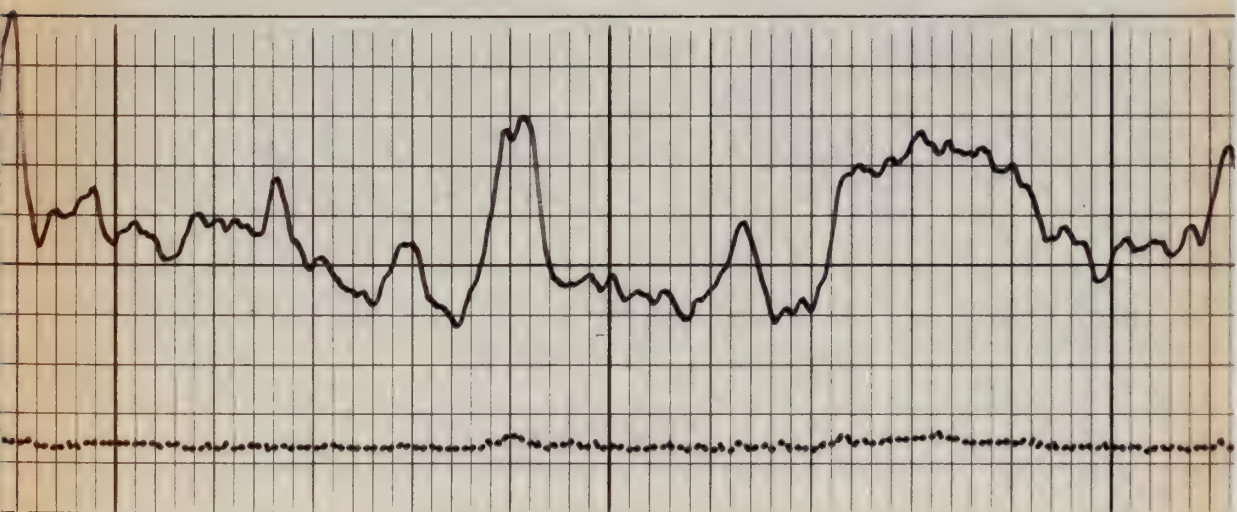
0800

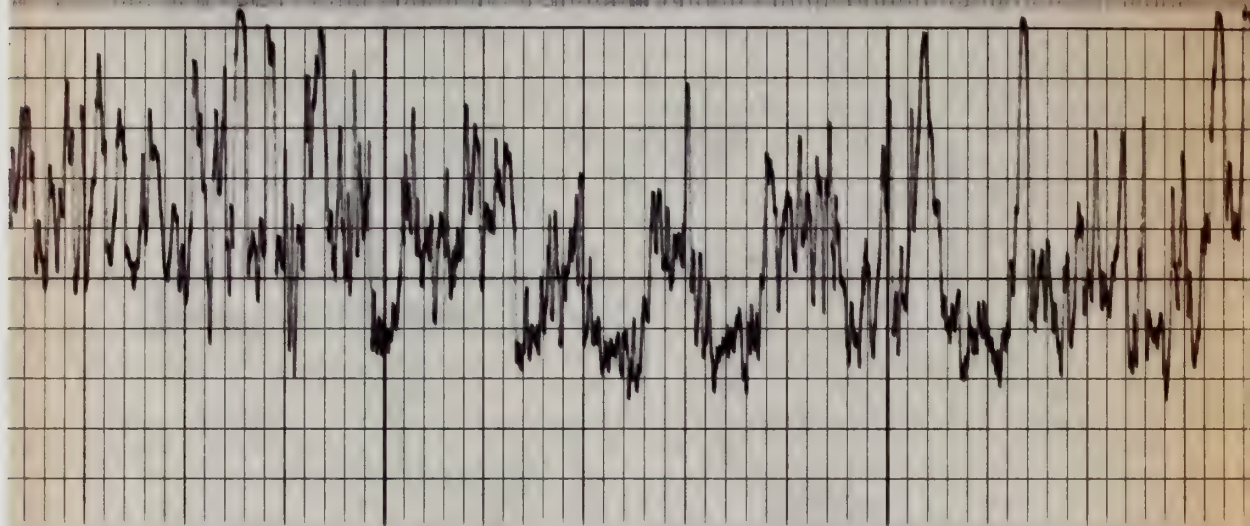
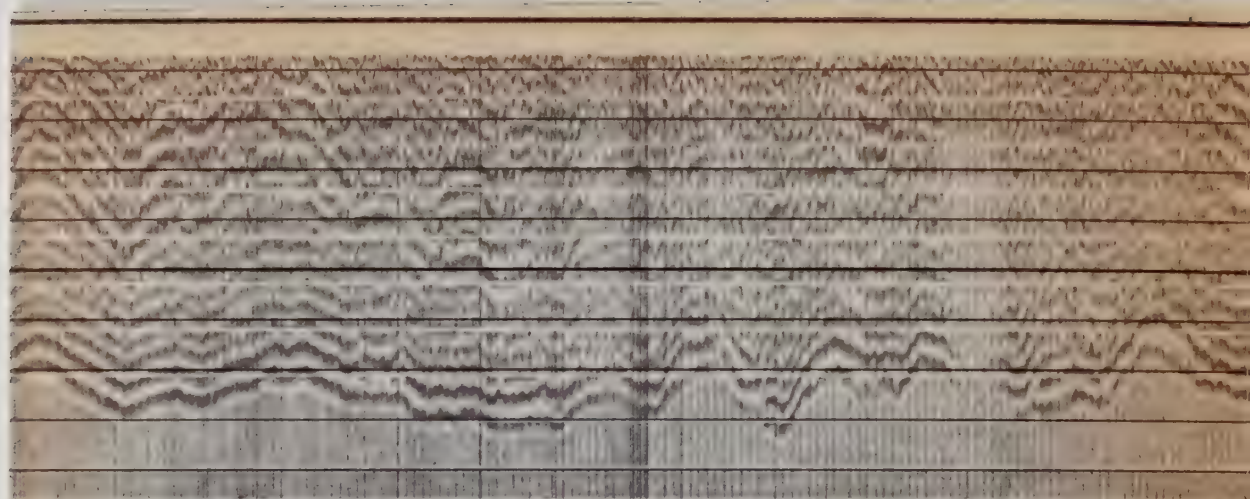




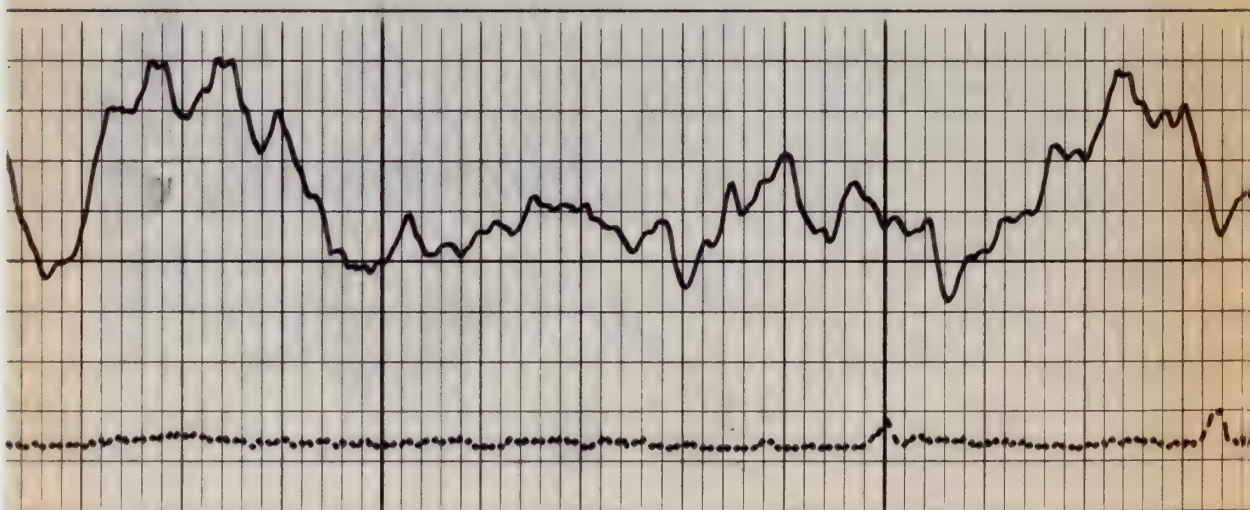
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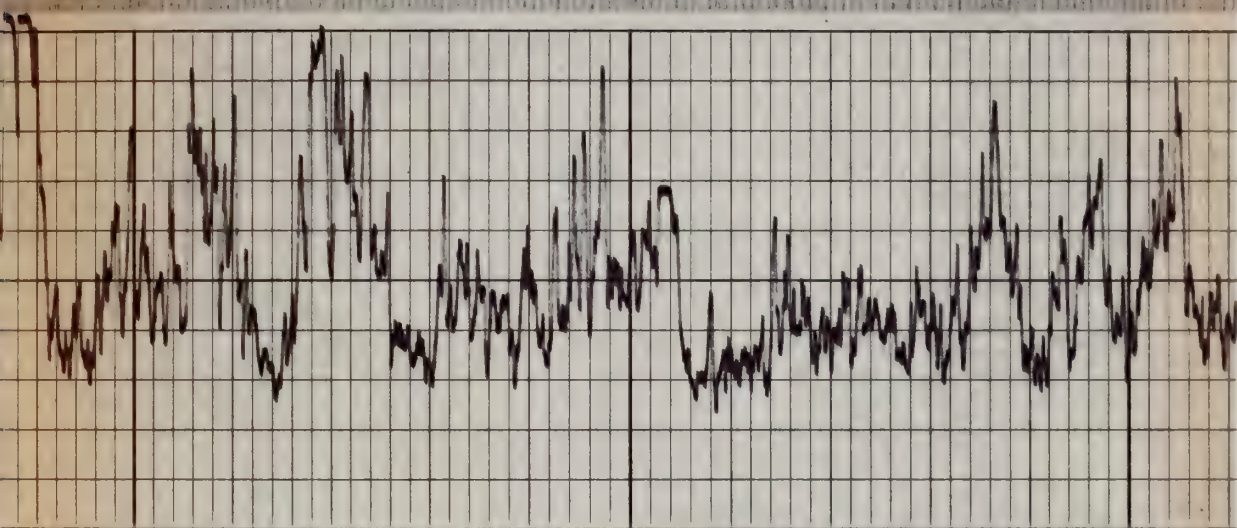
1000



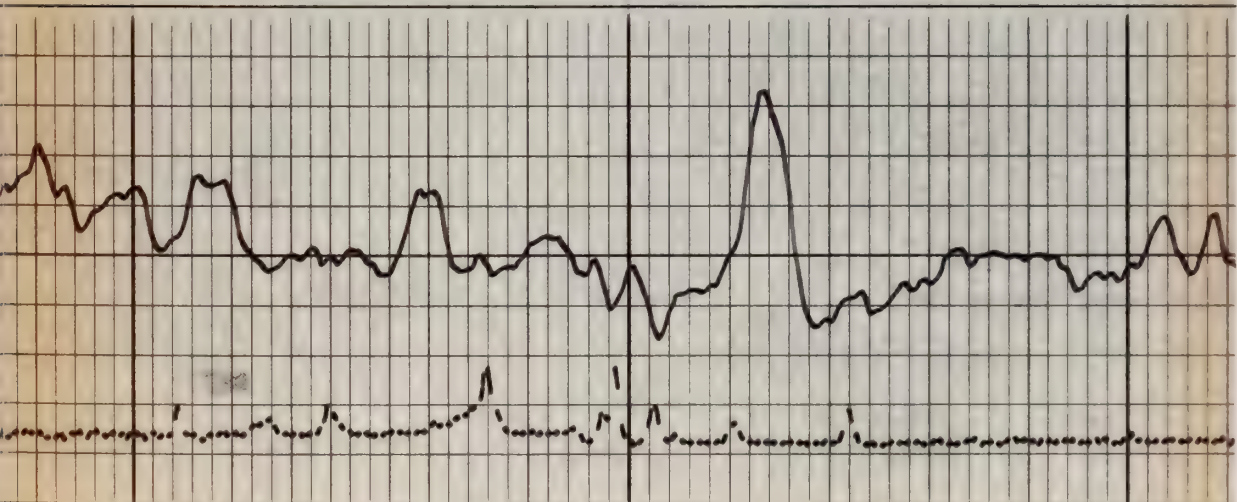


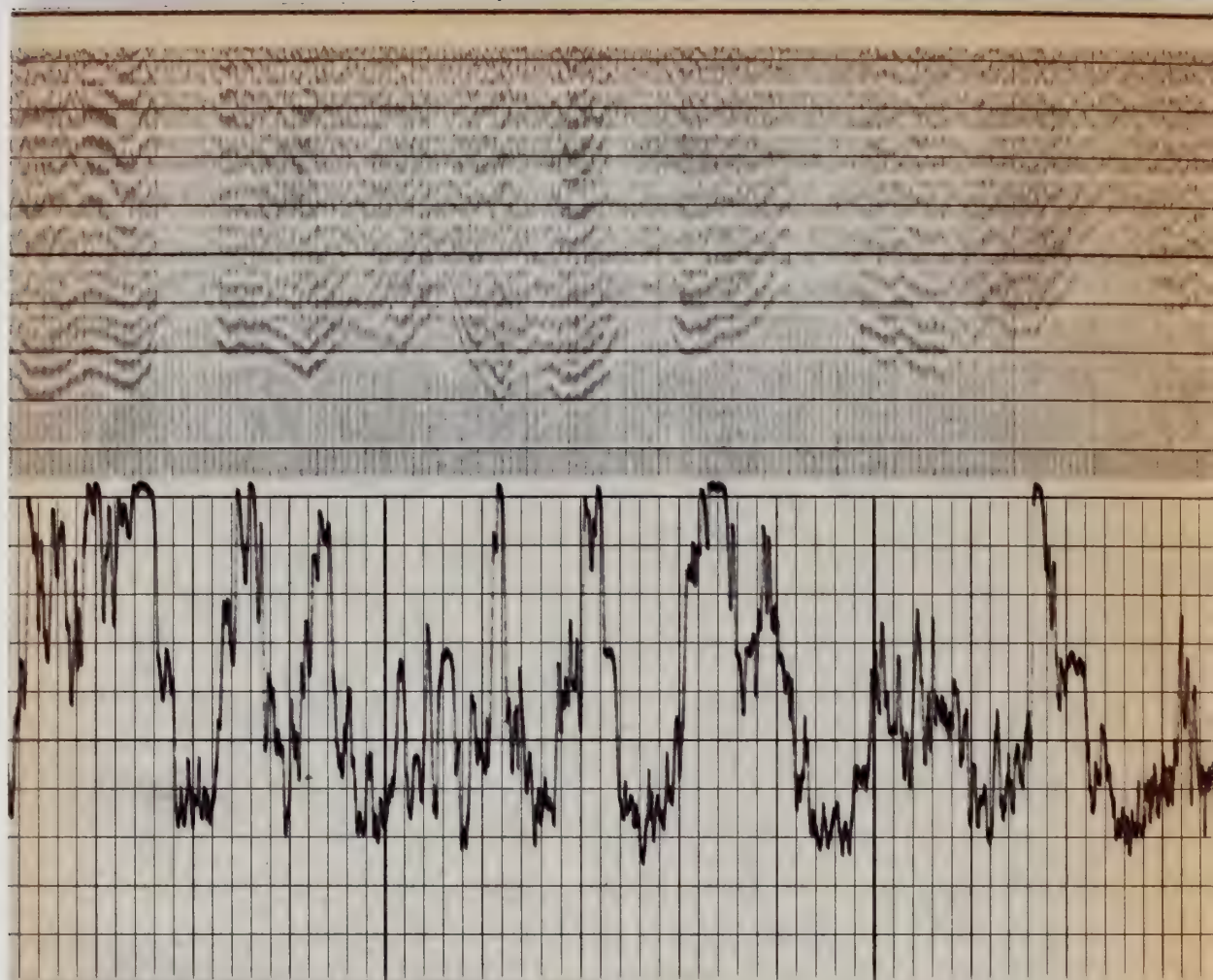
1100



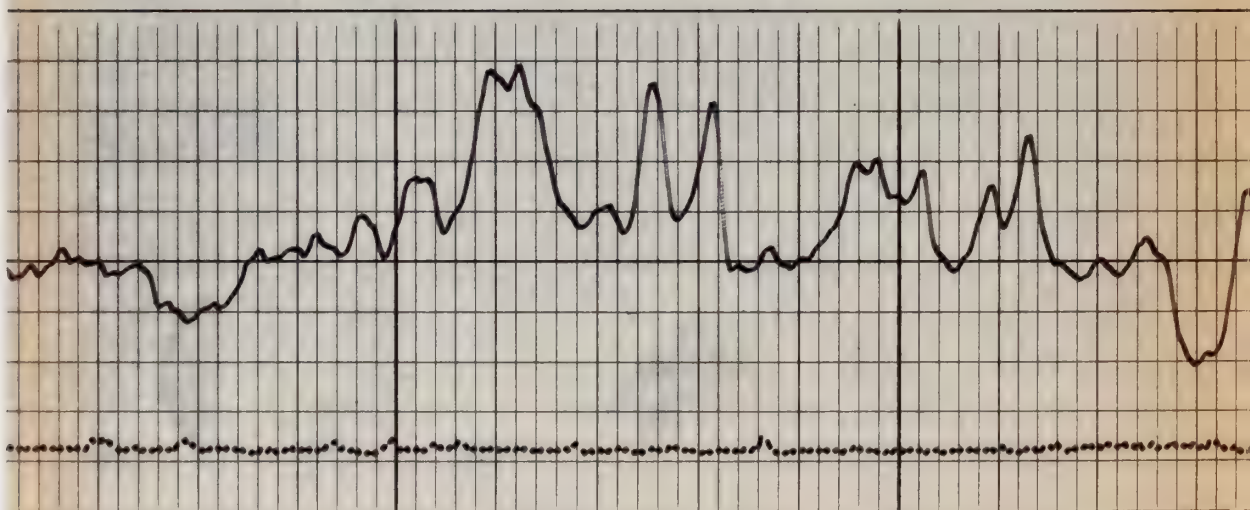


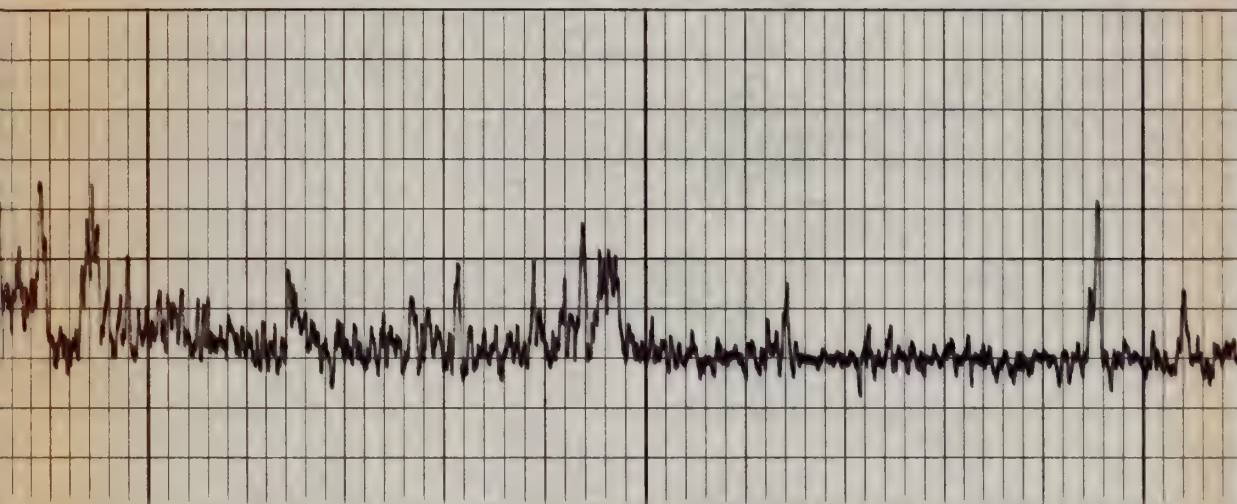
1200





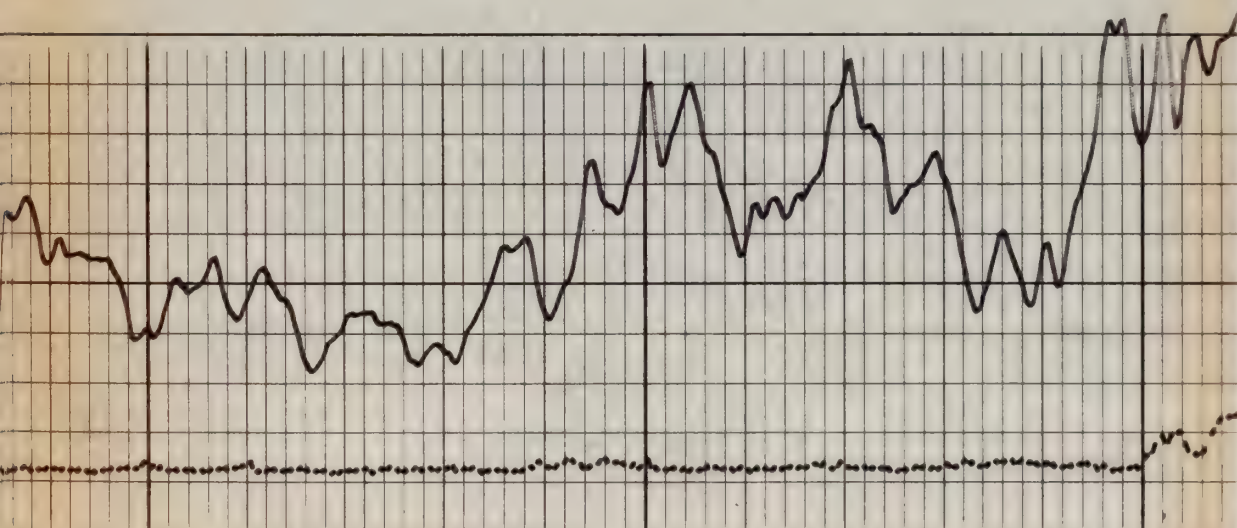
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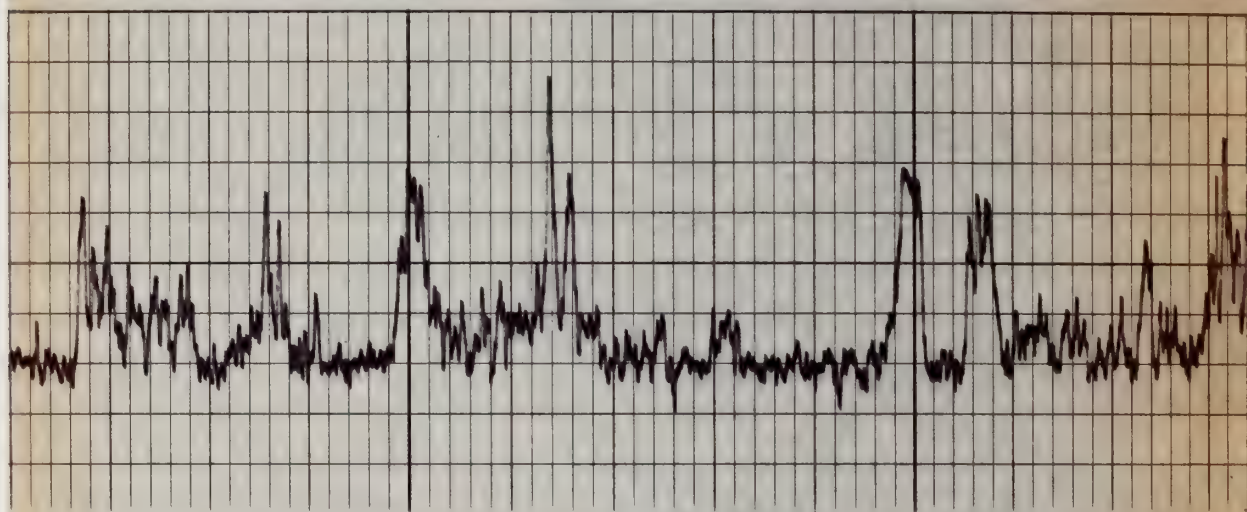




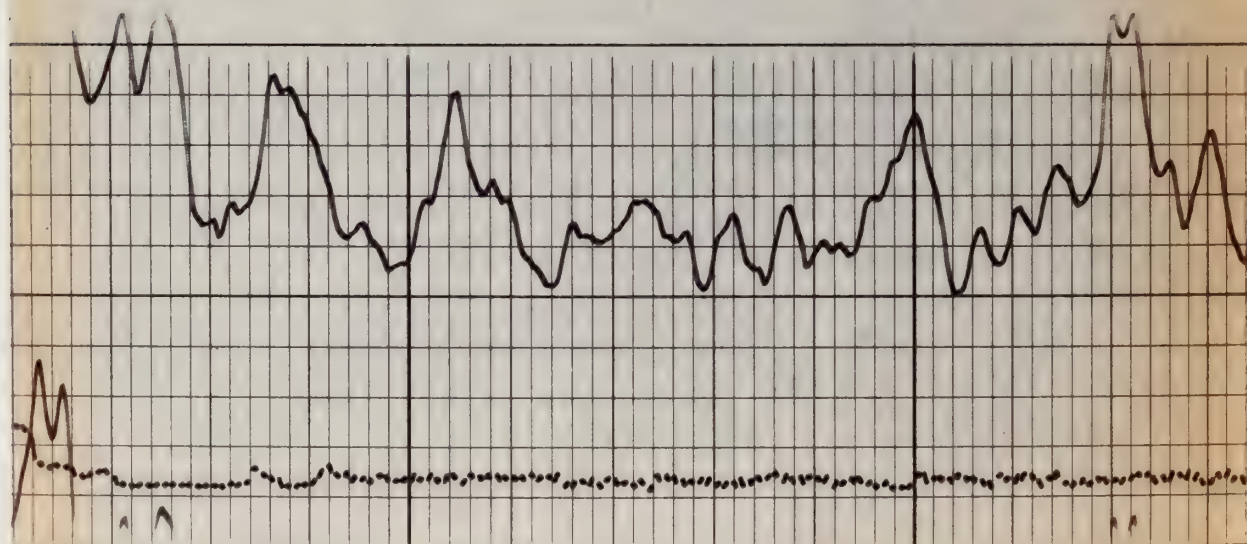
1400

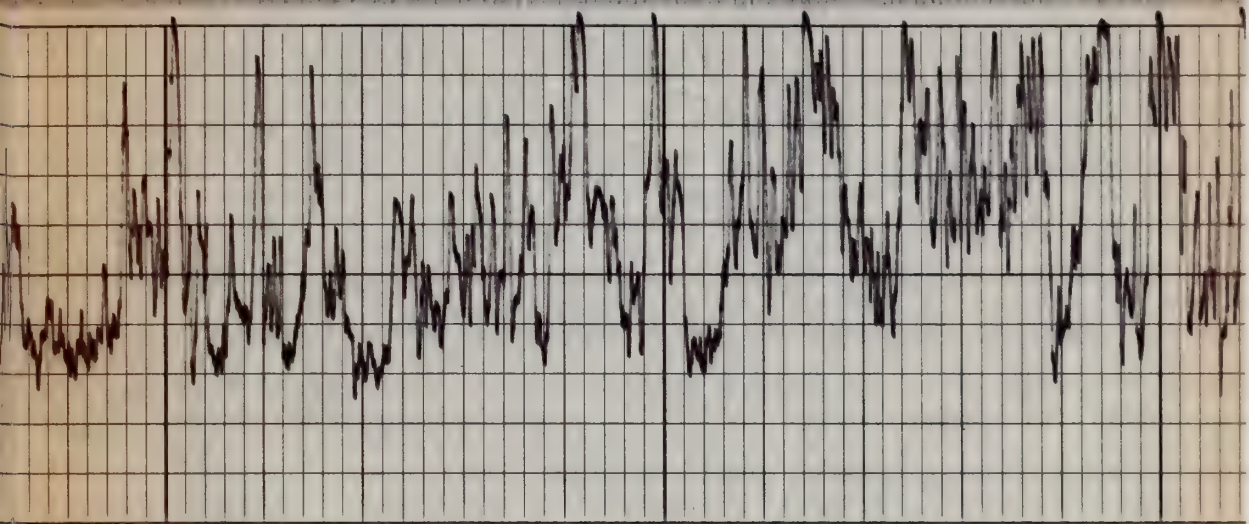
1500



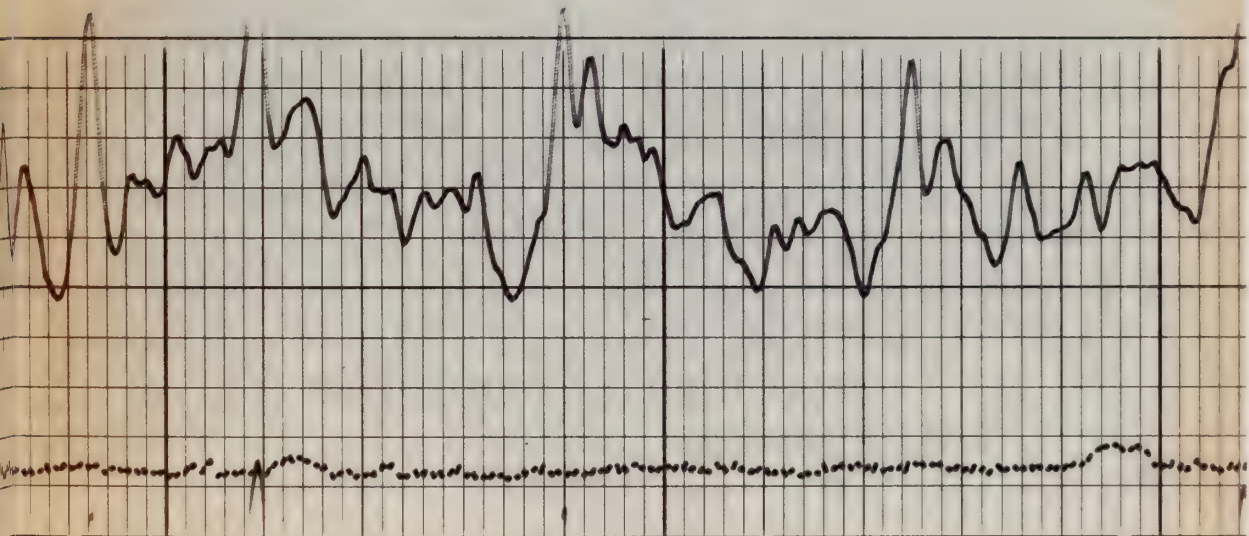


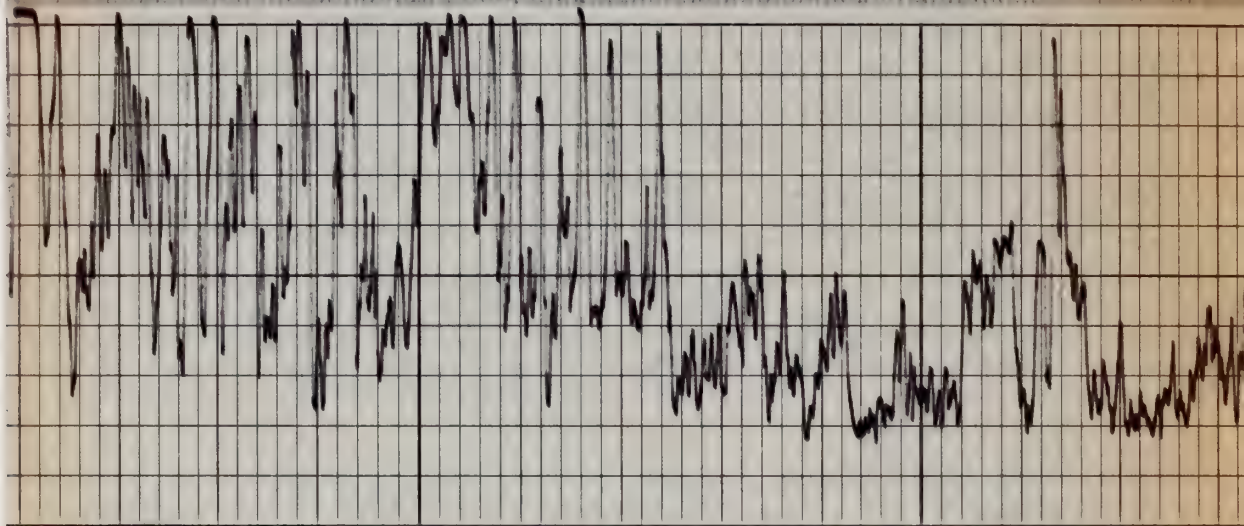
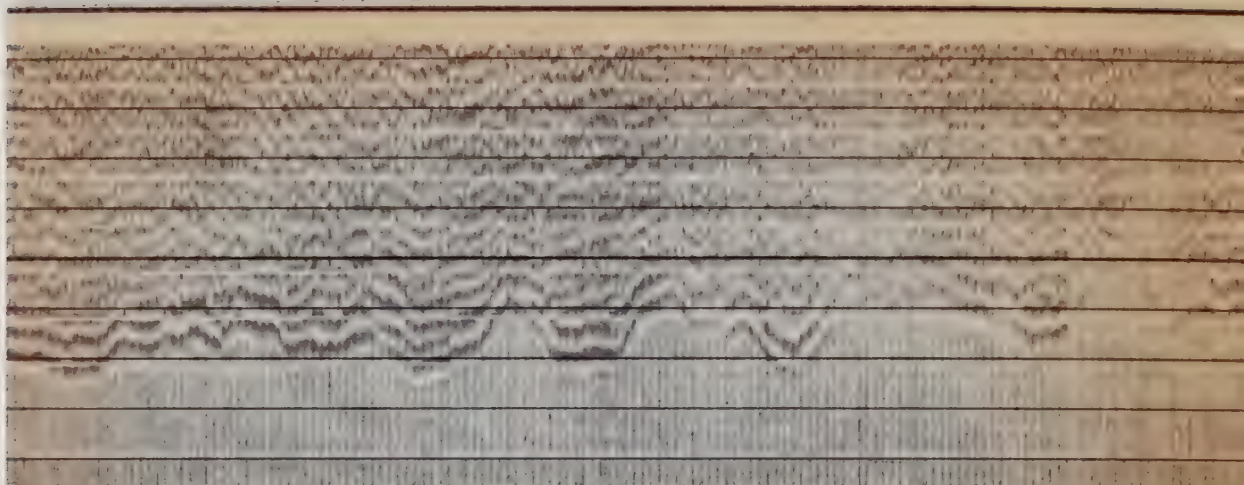
1600



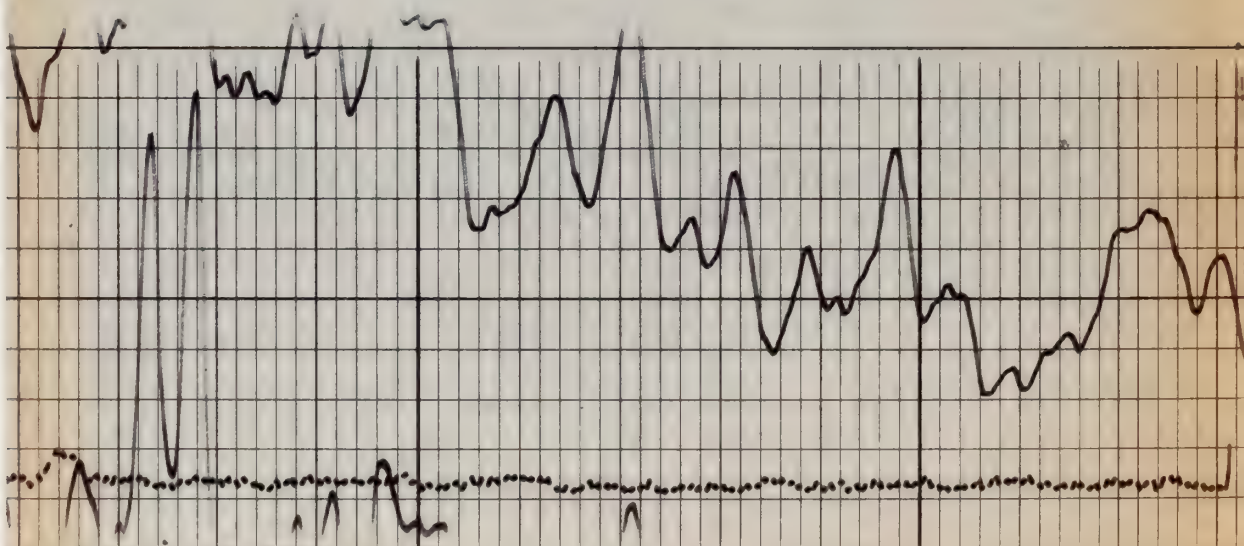


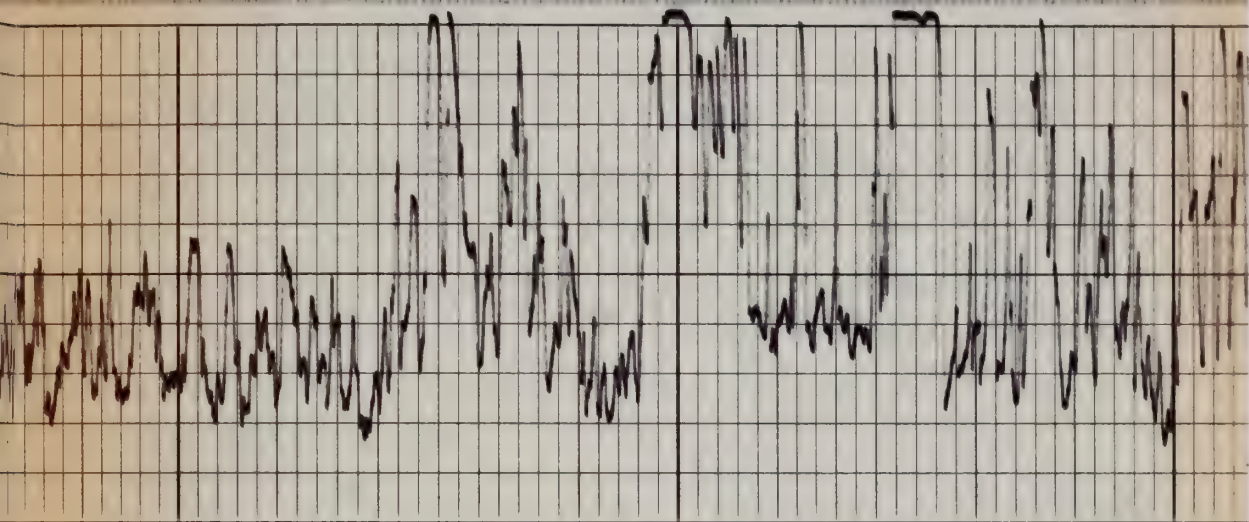
1700





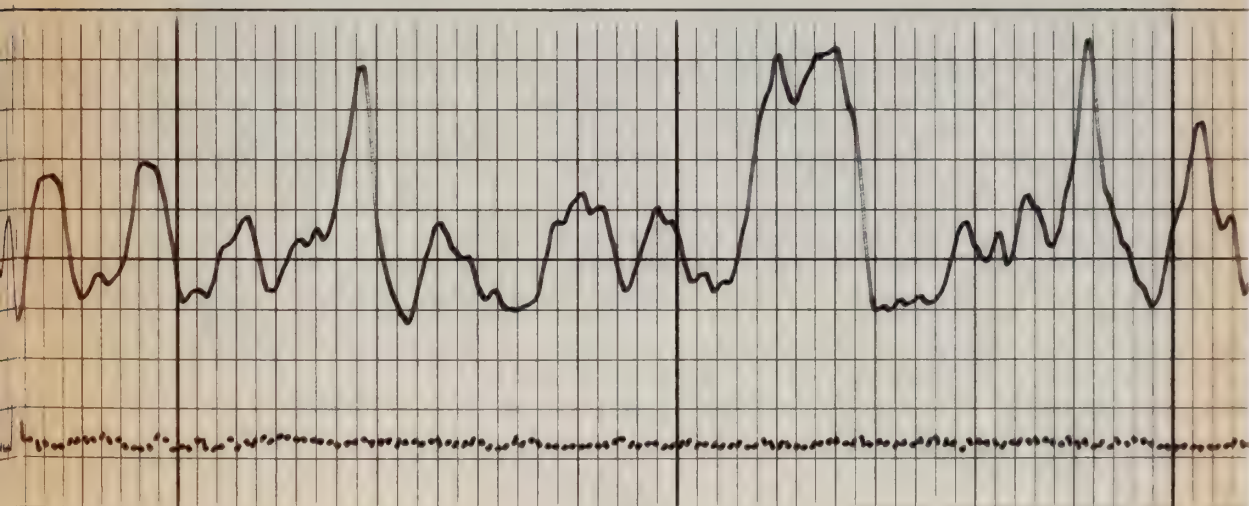
1800

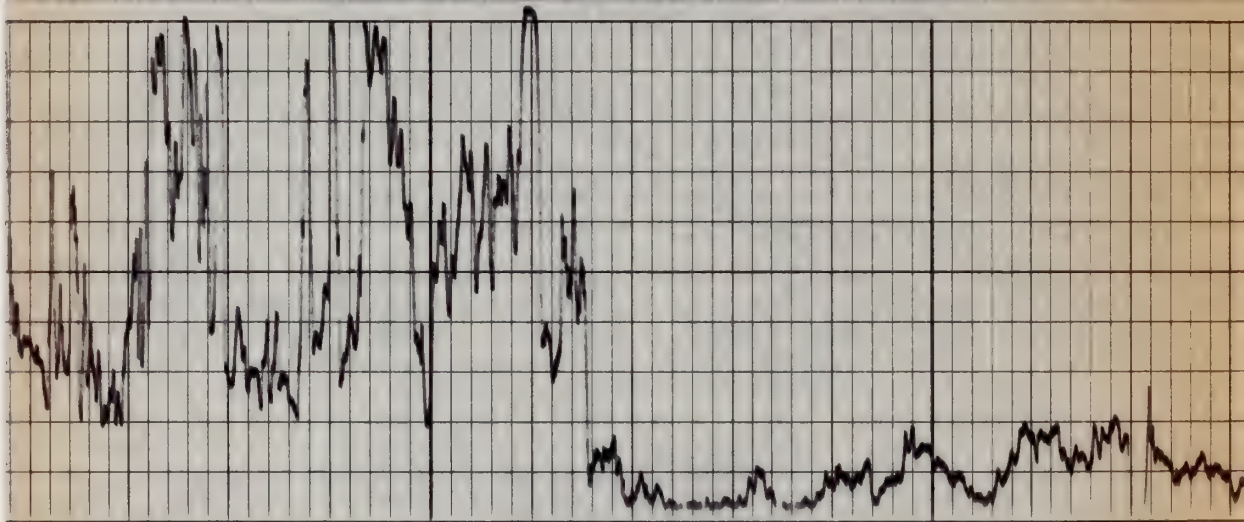
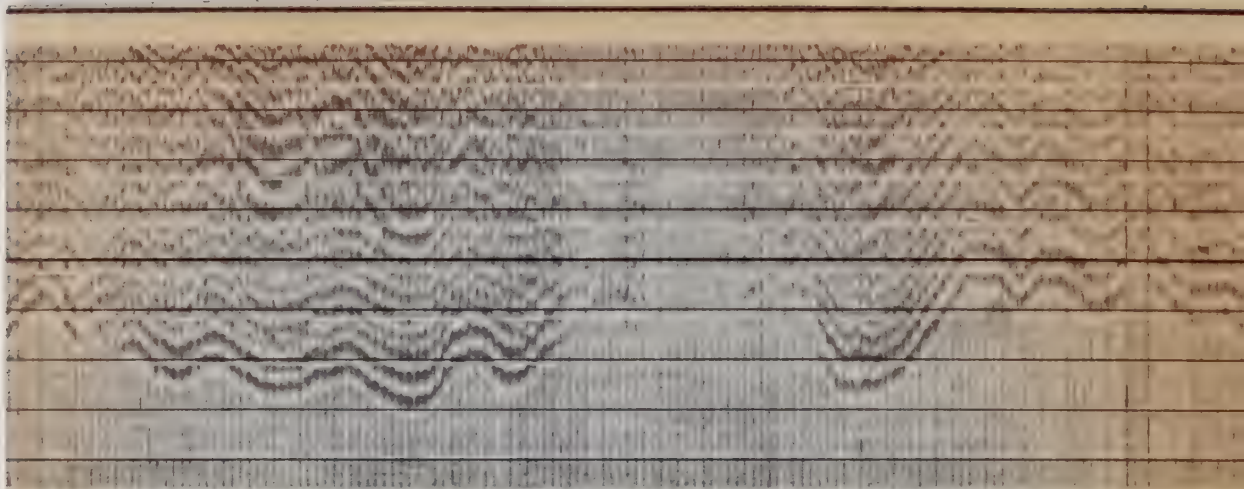




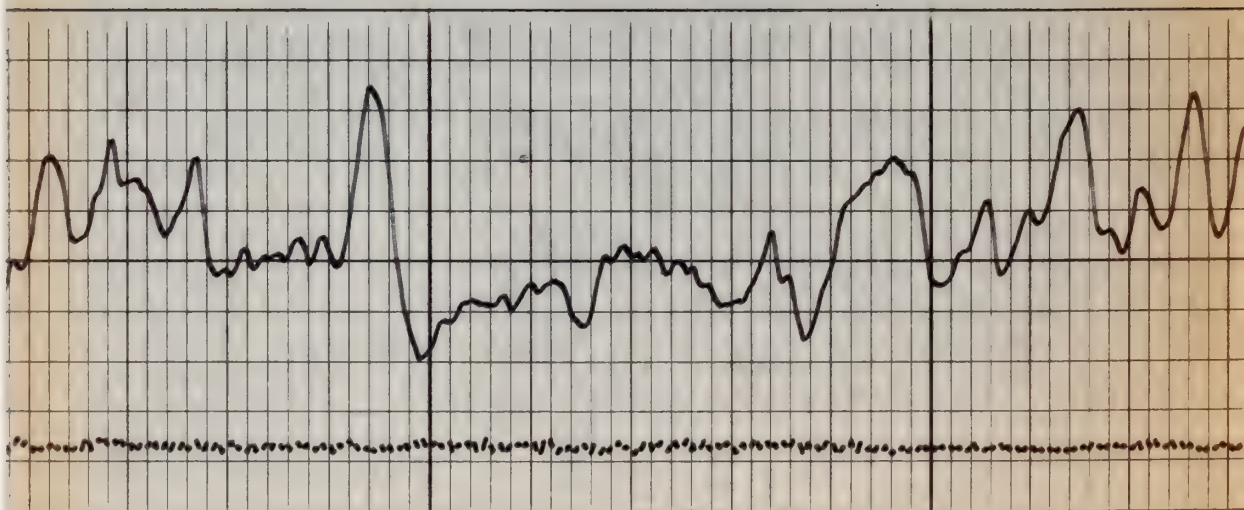
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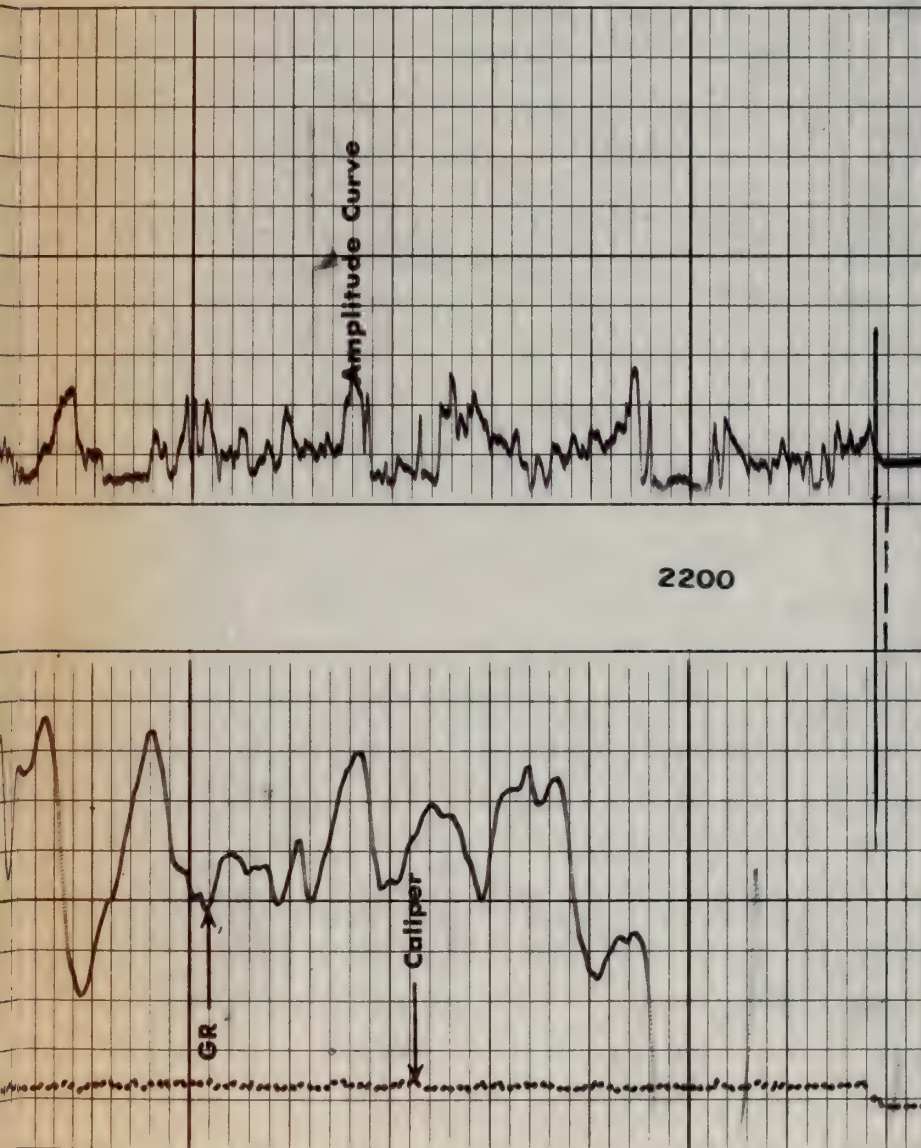
2000





2100





HERE

AMPLITUDE MILLIVOLTS

0 50

VARIABLE DENSITY

MICROSECONDS

200 1200

GAMMA RAY

API UNITS

0 150
150 300

CALIPER

DIAM. IN INCHES

5 15

DEPTH

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2219

SCHL. TD 2220

DRLR TD 2220

Elev:

KB

DF

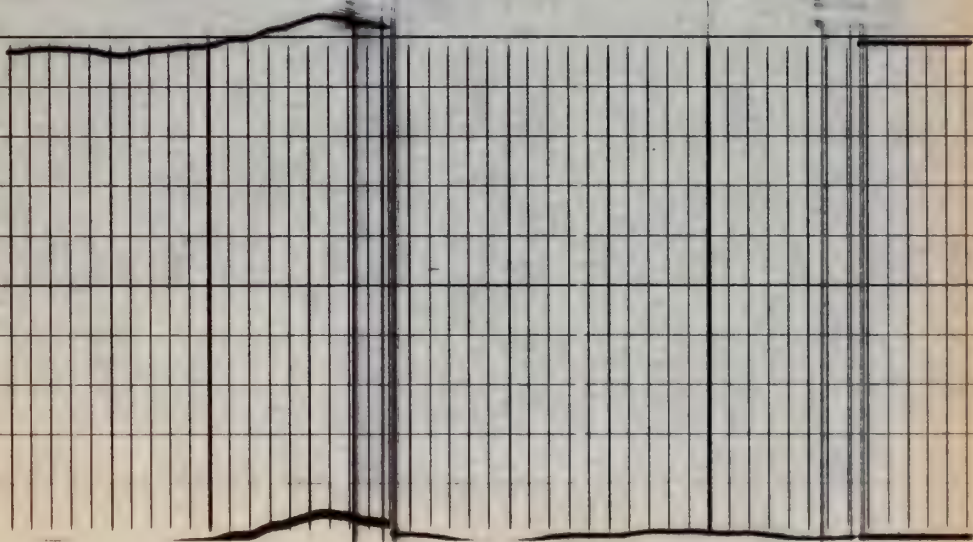
GL 6888

CALIBRATION RECORD



CALIBRATION AFTER SURVEY

CALIBRATION BEFORE SURVEY



CALIBRATION RECORD

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH #6

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2219

SCHL. TD 2220

DRLR TD 2220

Elev:

KB

DF

GL 6888

Schlumberger

CEMENT BOND LOG

VDL-CCL

COUNTY <u>RIO BLANCO</u> Field or LOCATION <u>SORGHUM GULCH</u> WELL <u>S.G. NO. 9</u> COMPANY <u>ATLANTIC RICHFIELD COMPANY</u>	COMPANY <u>ATLANTIC RICHFIELD COMPANY</u>					
	WELL <u>S.G. NO. 9</u>					
	FIELD <u>SORGHUM GULCH</u>					
	COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u>					
LOCATION API Serial No. _____ Sec. <u>11</u> Twp. <u>3S</u> Rge. <u>97W</u>				Other Services: _____ _____		
Permanent Datum: <u>GROUND LEVEL</u> , Elev. <u>6870</u> Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum Drilling Measured From <u>GL</u>						Elev.: K.B. <u>----</u> D.F. <u>----</u> G.L. <u>6870</u>
Date	<u>10/29/74</u>		Type Drill Fluid	<u>WATER</u>		
Run No. <u>NO. 1</u>	<u>STRING NO. 2</u>		Fluid Level	<u>FULL</u>		
Depth — Driller	<u>-----</u>		Max. Rec. Temp.	<u>-----</u> °F		
Depth — Logger	<u>2720</u>	<u>1338</u>	Est. Cement Top	<u>830</u>		
Btm. Log Interval	<u>2712</u>	<u>1330</u>	Equip. Location	<u>3802</u>	<u>VERNAL</u>	
Top Log Interval	<u>700</u>	<u>700</u>	Recorded By	<u>ST. AUBYN</u>		
Open Hole Size	<u>7 7/8</u>		Witnessed By	<u>MR. BURNS</u>		
CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String	<u>8 5/8</u>			<u>T&C</u>	<u>SURF</u>	<u>65</u>
String (1)	<u>2 3/8</u>	<u>4.7</u>		<u>T&C</u>	<u>SURF</u>	<u>2740</u>
String (2)	<u>2 3/8</u>	<u>4.7</u>		<u>T&C</u>	<u>SURF</u>	<u>1330</u>
Liner						
PRIMARY CEMENTING DATA						
STRING	Surface	Protection	Production		Liner	
Vol. of cement			<u>425 SKS</u>			
Type of cement			<u>HOWCO LT. WT.</u>			
Additive			<u>10#/SK-GILSONITE</u>			
Retarder						
Wt. of slurry						
Water loss						
Type fluid in csg.						
Fluid wt.						

FOLD HERE The well name, location and borehole reference data were furnished by the customer.

PRIMARY CEMENTING PROCEDURE		REMARKS
	Hour — date	Hours from start of operation
Started pumping cement	22:30-10/25/74	
Release pressure	23:30-10/25/74	
Start Cement Bond Log	08:00-10/29/74	
Finish Cement Bond Log	19:00-10/29/74	

Preceding fluid _____ Volume _____ bbls.
 Cement pumped _____ bbls./minute

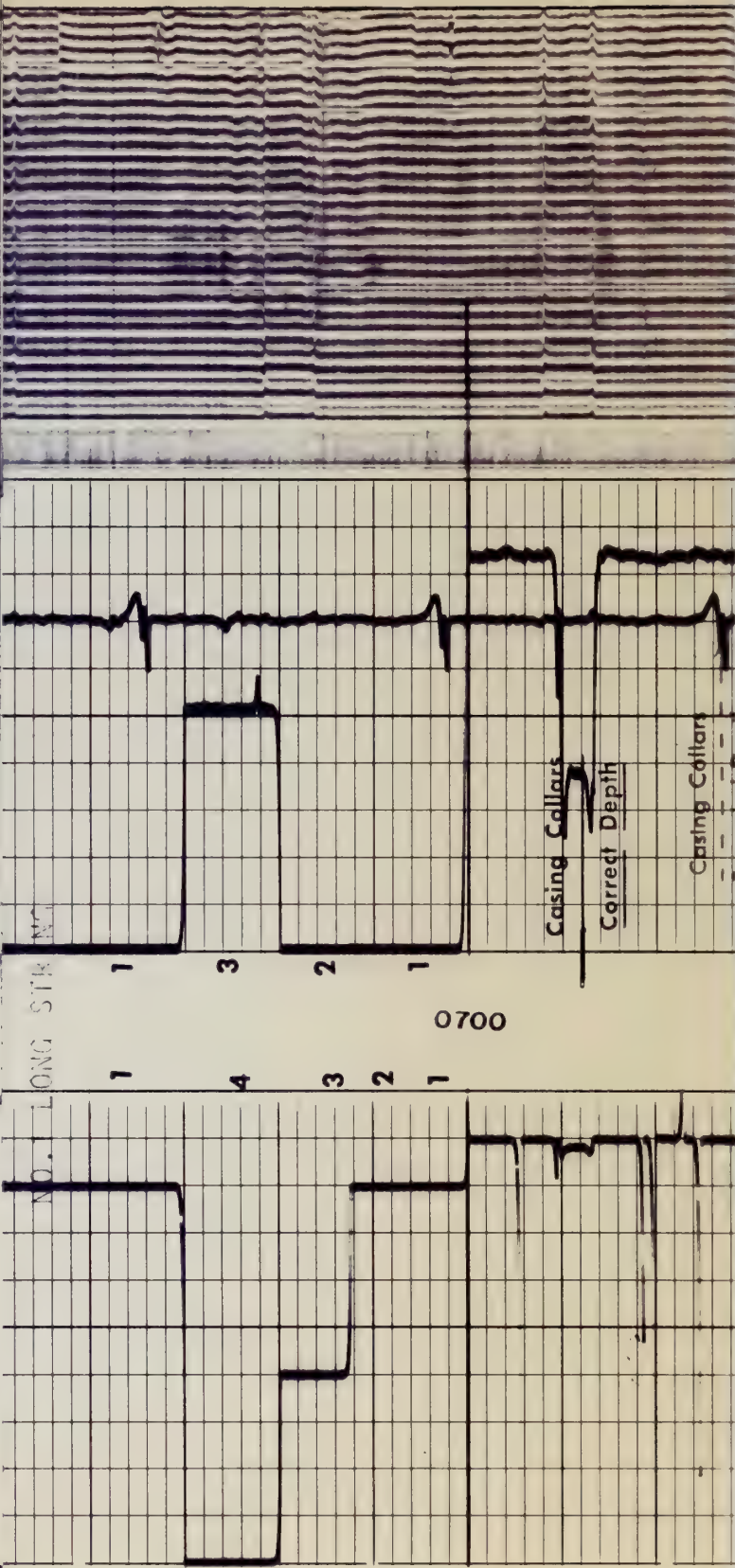
Pipe reciprocated during Pumping: Yes _____ No _____
 Pipe reciprocated after plug down: Yes _____ min., No _____

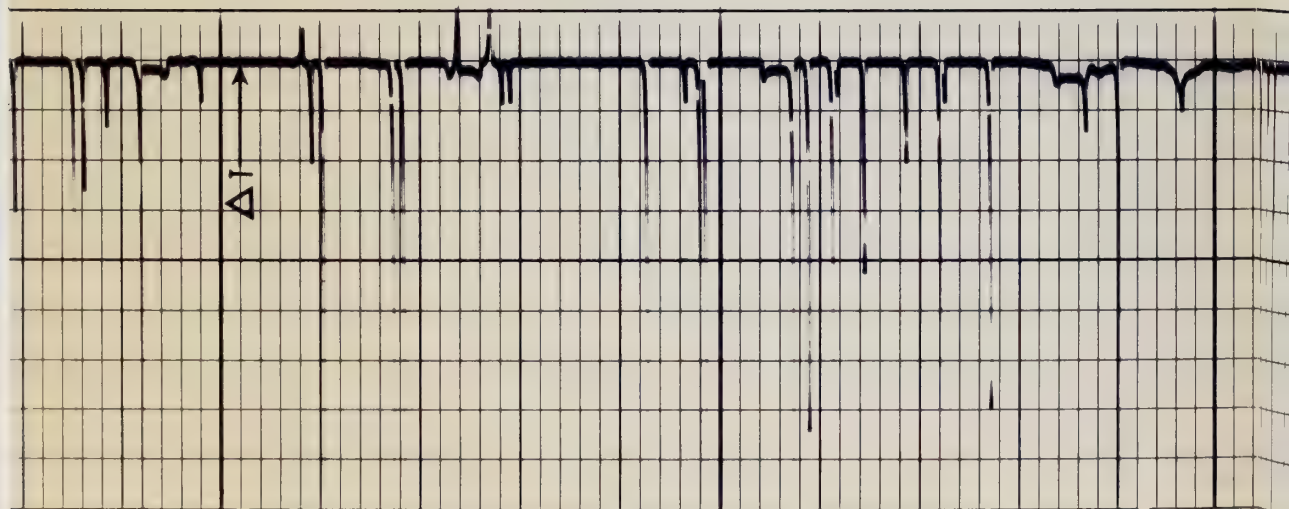
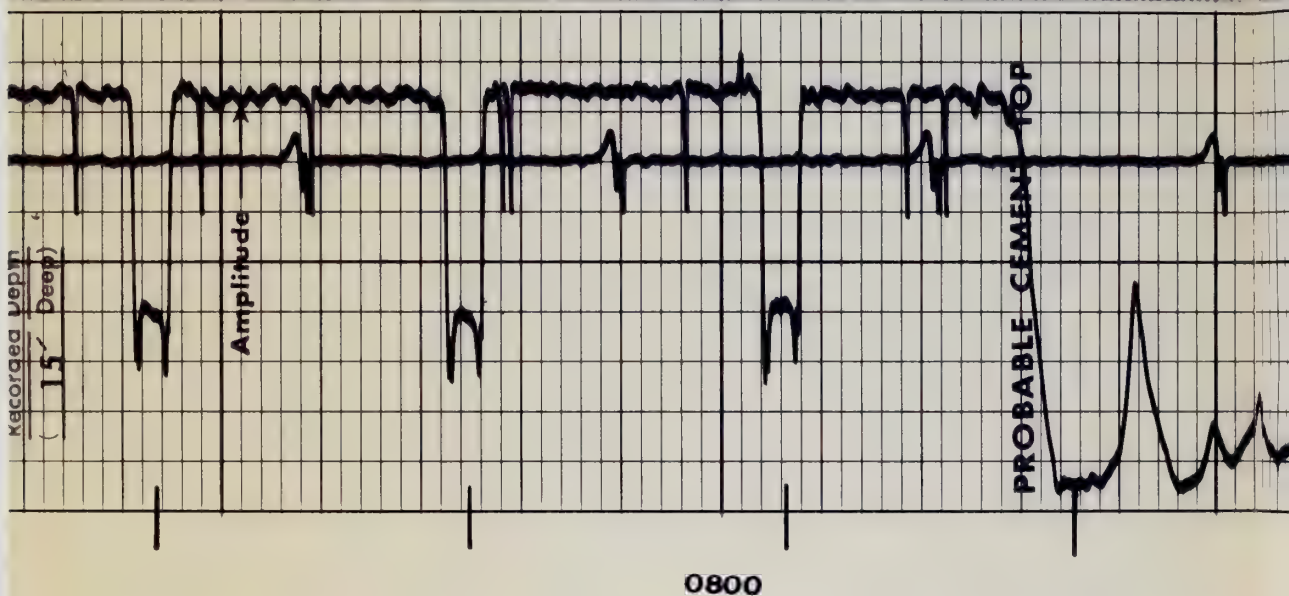
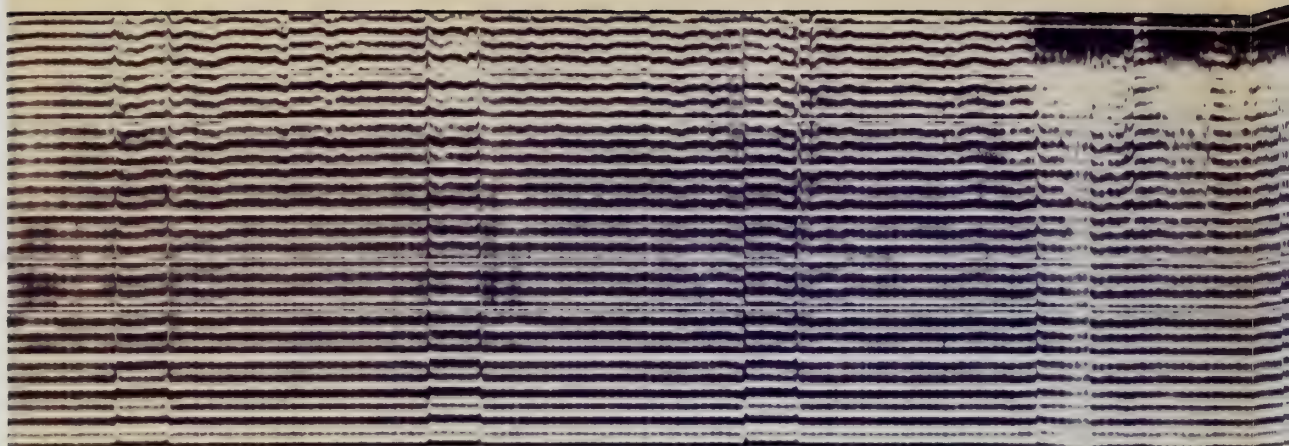
SQUEEZE JOB DETAIL			EQUIPMENT DATA	Centralizer Depths	Scratcher Depths
Squeeze number	1	2	Sonic Panel No.	SLP-FH #37	
Date			Sonic Cart No.	SLC-JD #83	
Depth interval			Sonic Sonde No.	SLS-JC #81	
Type cement			CRP No.	14	
Volume of cement			Mem Panel No.	----	
Additive			GR Panel No.	----	
Retarder			GR Cart No.	----	
			Centralizer: Type	CME-V	CAL-AJ
			No.	CME-W	
Weight of slurry			To Level (MV)	100	
Preceding fluid			Cart. Gain	1/20	
			CRP Intensity	1	
Breakdown pressure			R9G Intensity	7 3/4	
Max. pressure-stage 1					
" " " 2					
" " " 3					
Final maximum pressure			Logging Speed	30 FPM	
			Time Constant		
Started pumping cement					
Released pressure					
Start CBL					
Finish CBL					

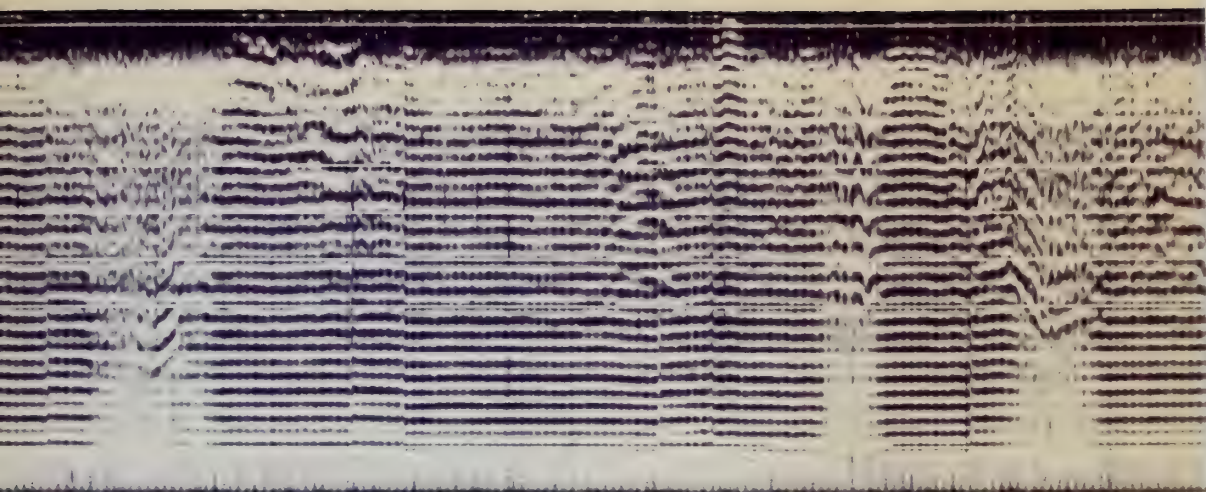
AVERAGE WELL DRIFT: _____ from _____ to _____ ; _____ from _____ to _____ ; _____ from _____ to _____

MICROSECONDS	SPACING
400	200
MILLIVOLTS	
0 100	
MICROSECONDS	
200 1200	

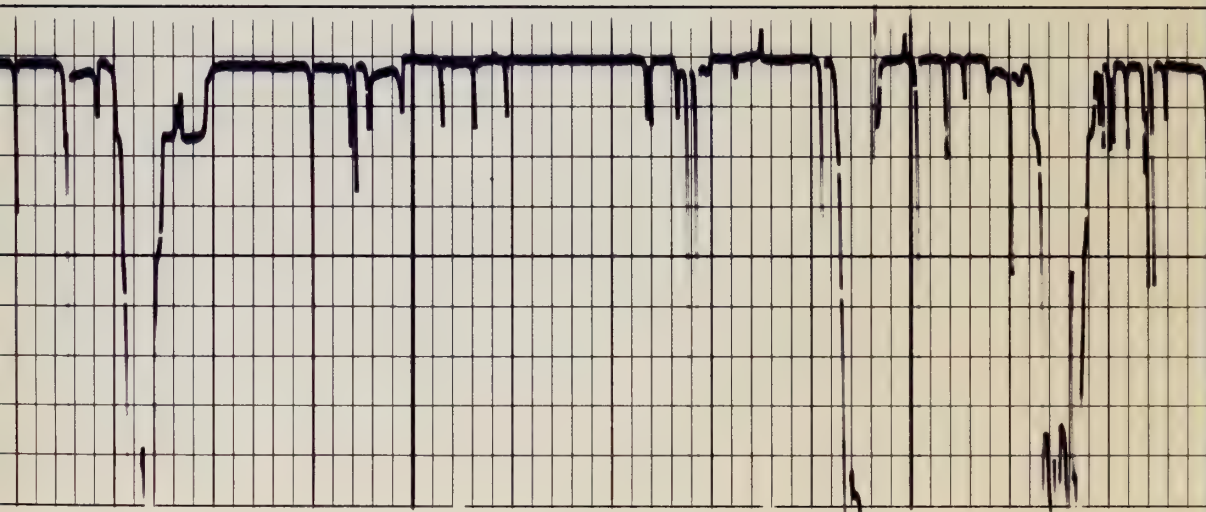
DEPTH

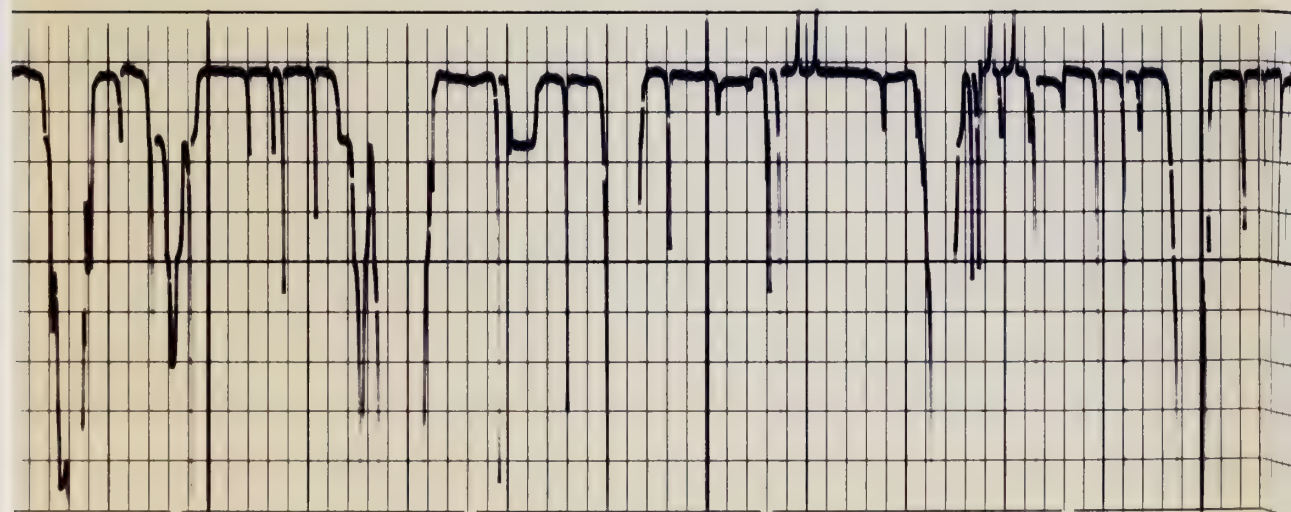
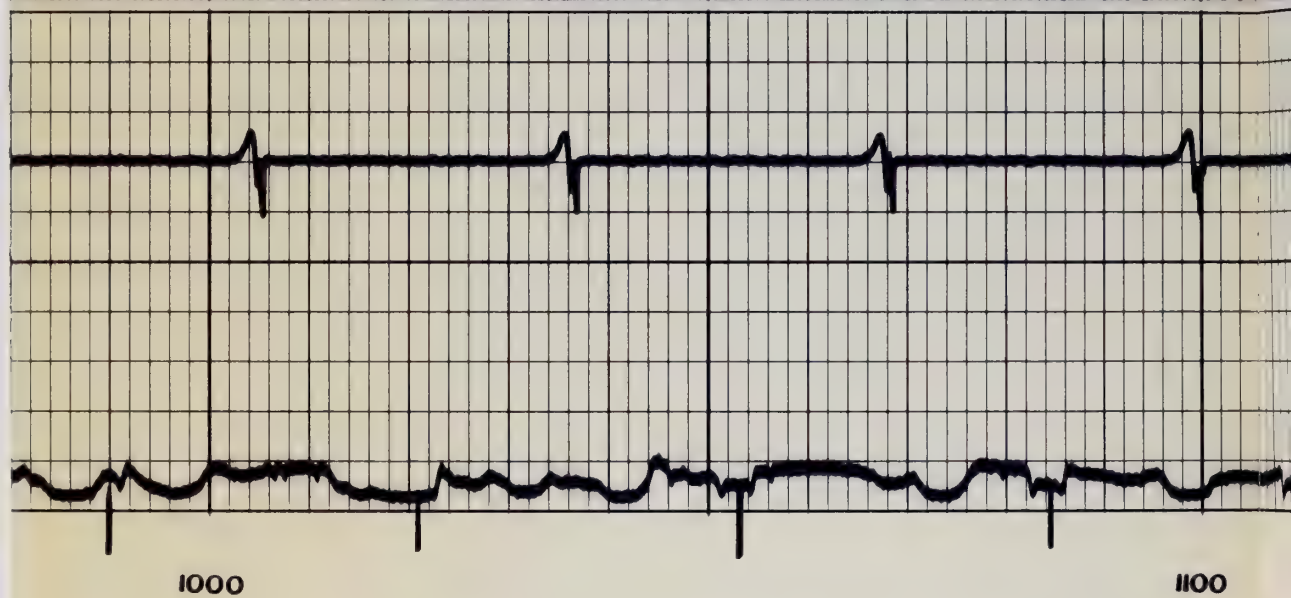
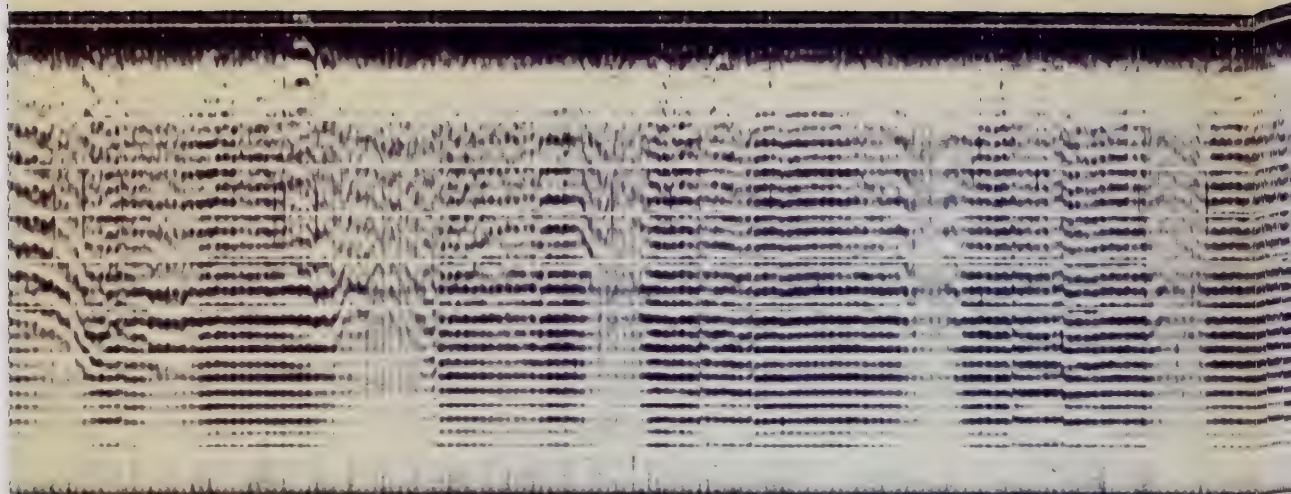


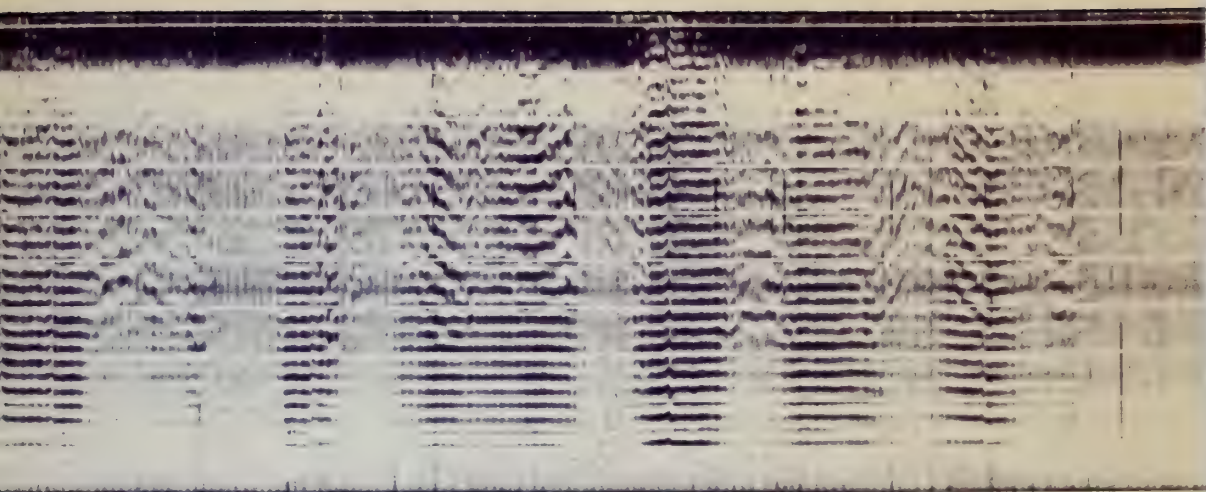




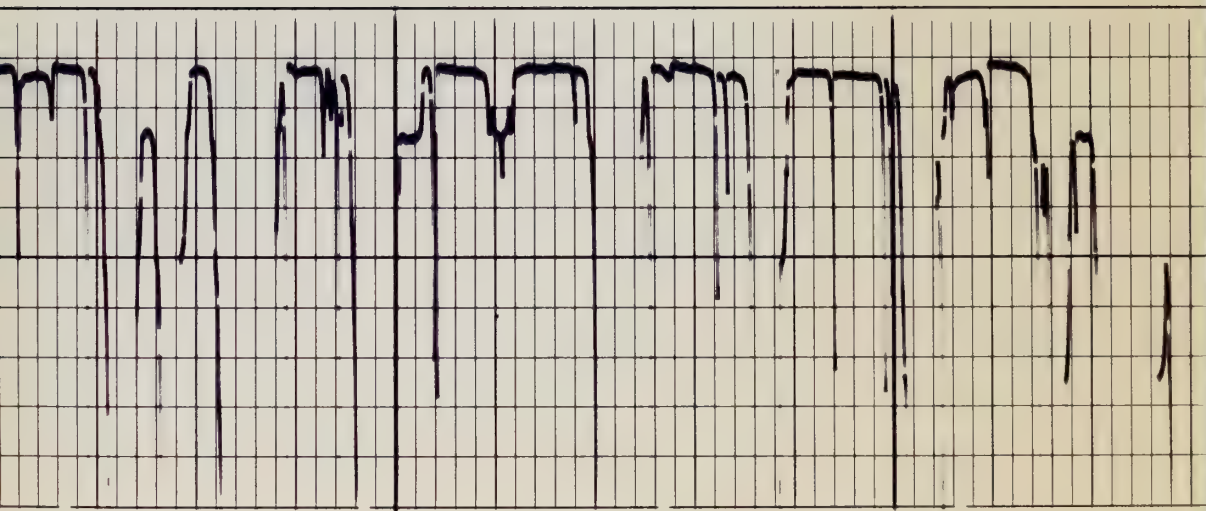
0900

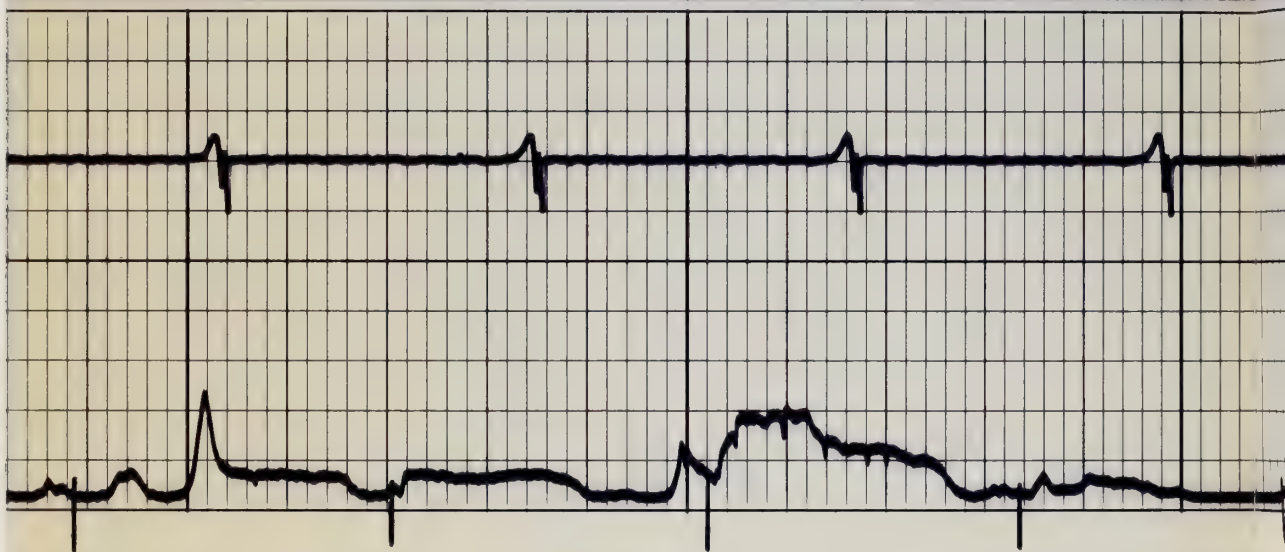
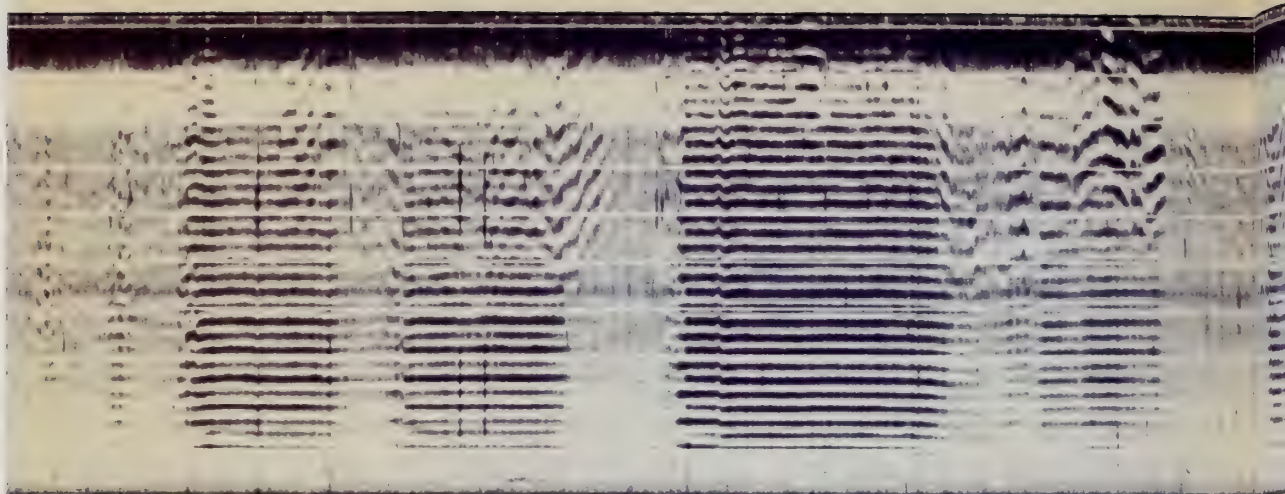




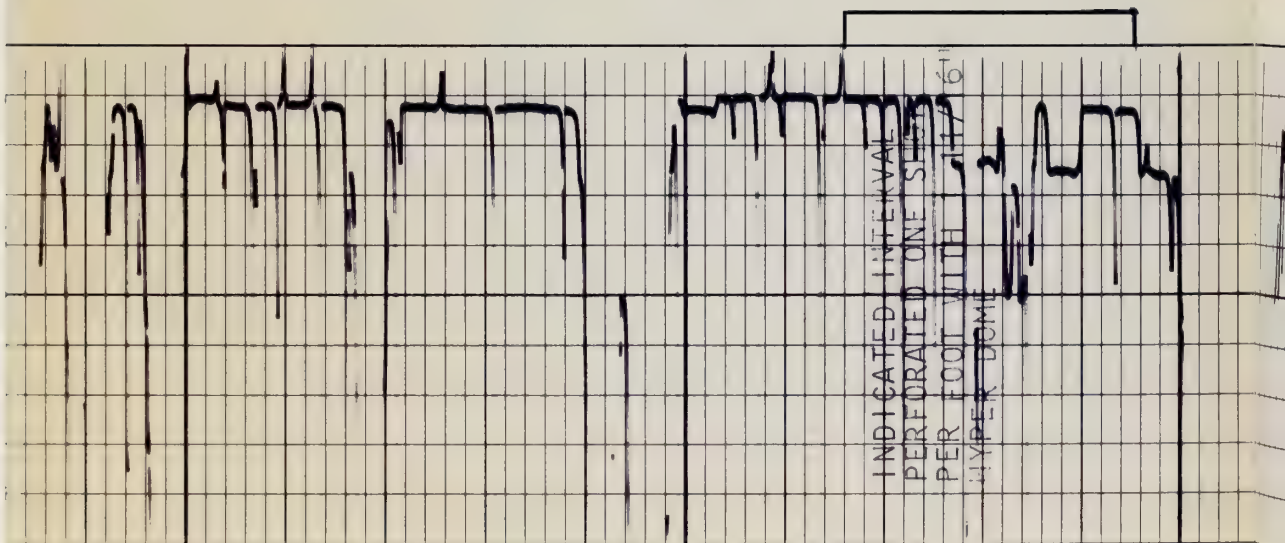


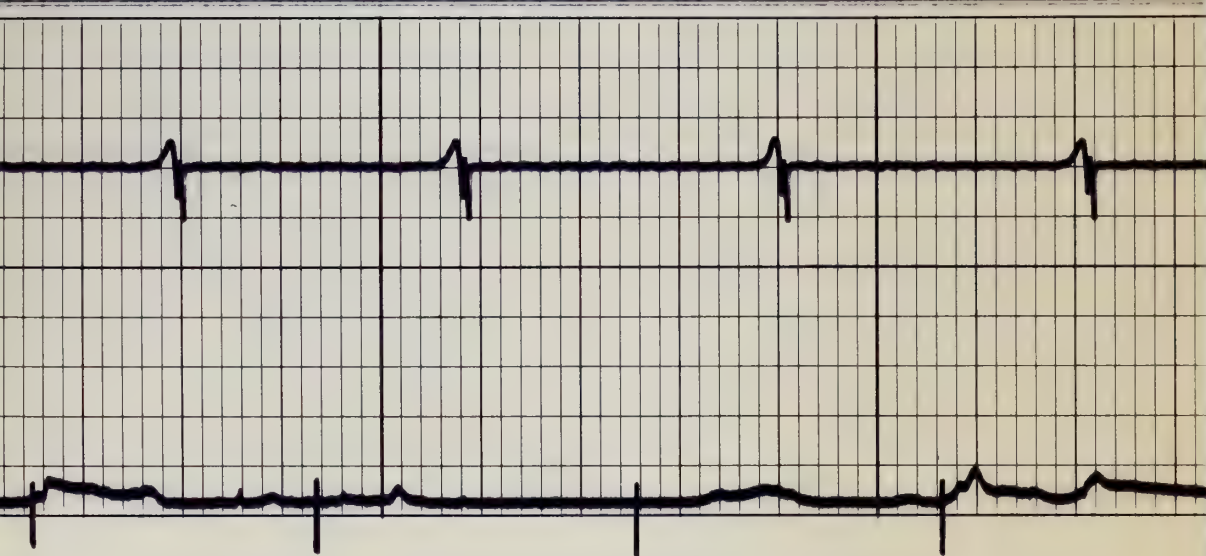
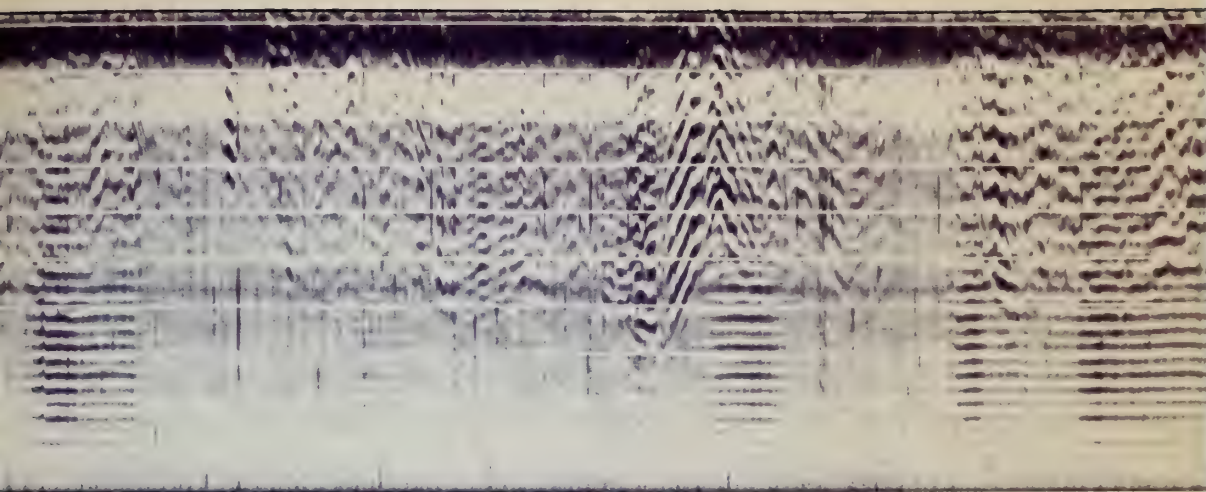
1200



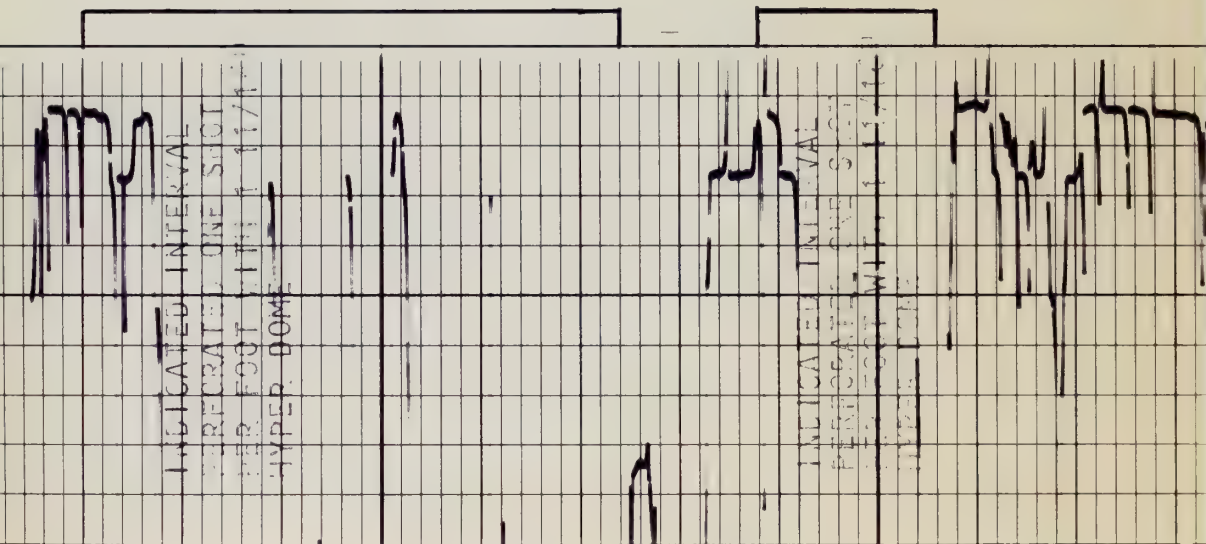


1300



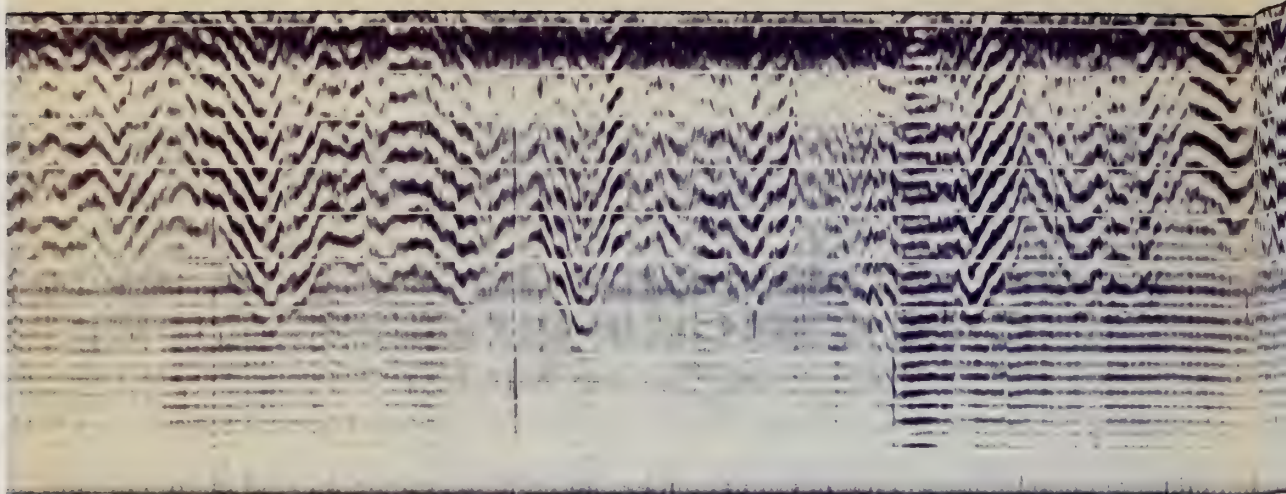


1400



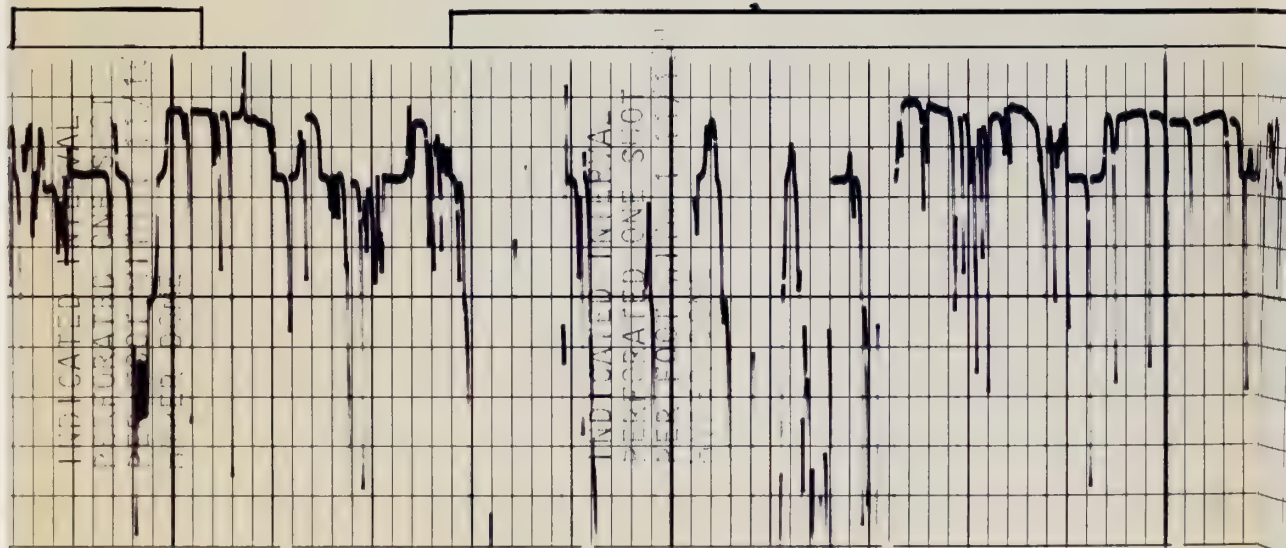
INDICATED INTERVAL
PERFORATED ONE SPOT
PER FOOT WITH 1 11/16
HYPER DOME

INDICATED INTERVAL
PERFORATED ONE SPOT
PER FOOT WITH 1 11/16
HYPER DOME



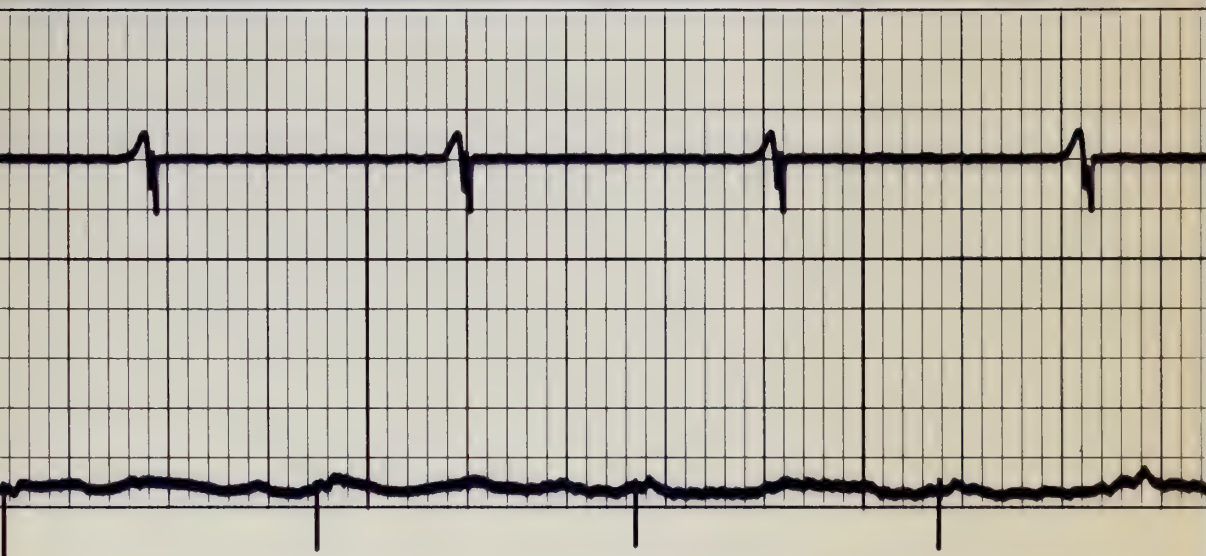
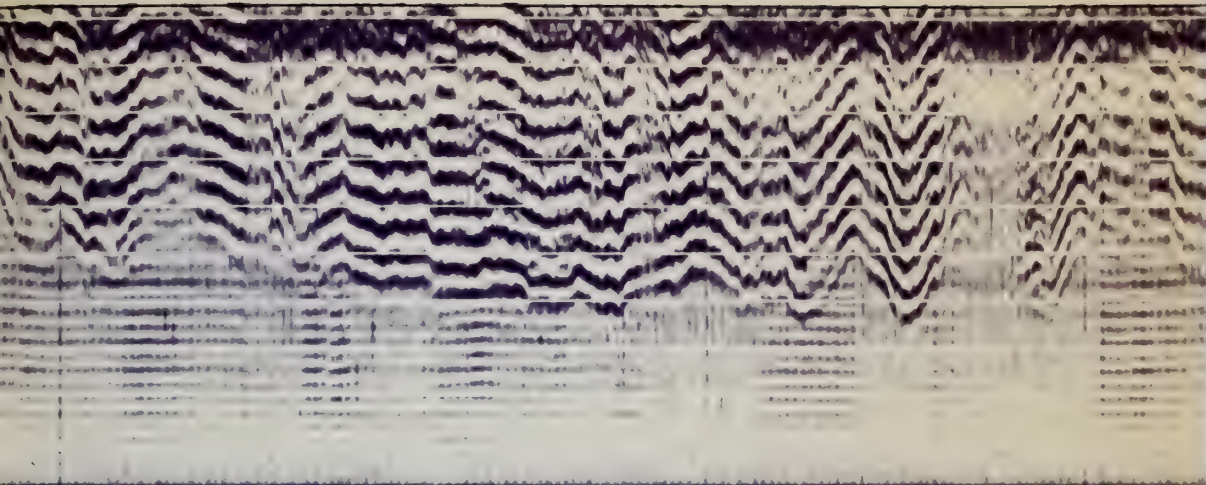
1500

1600

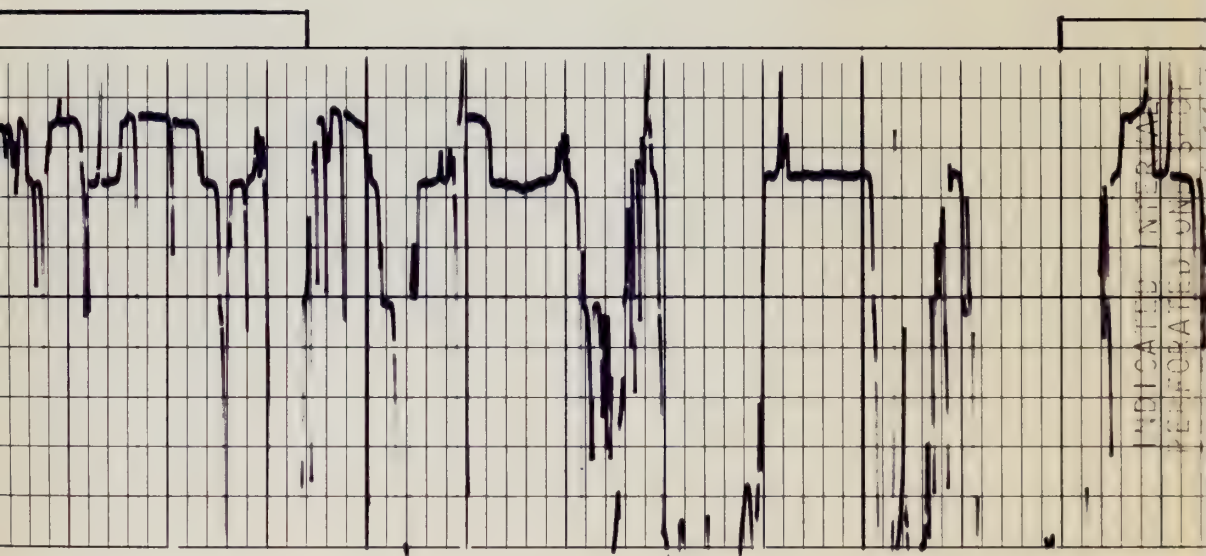


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PERFORATED ONE
PERFORATED ONE
PERFORATED ONE
PERFORATED ONE

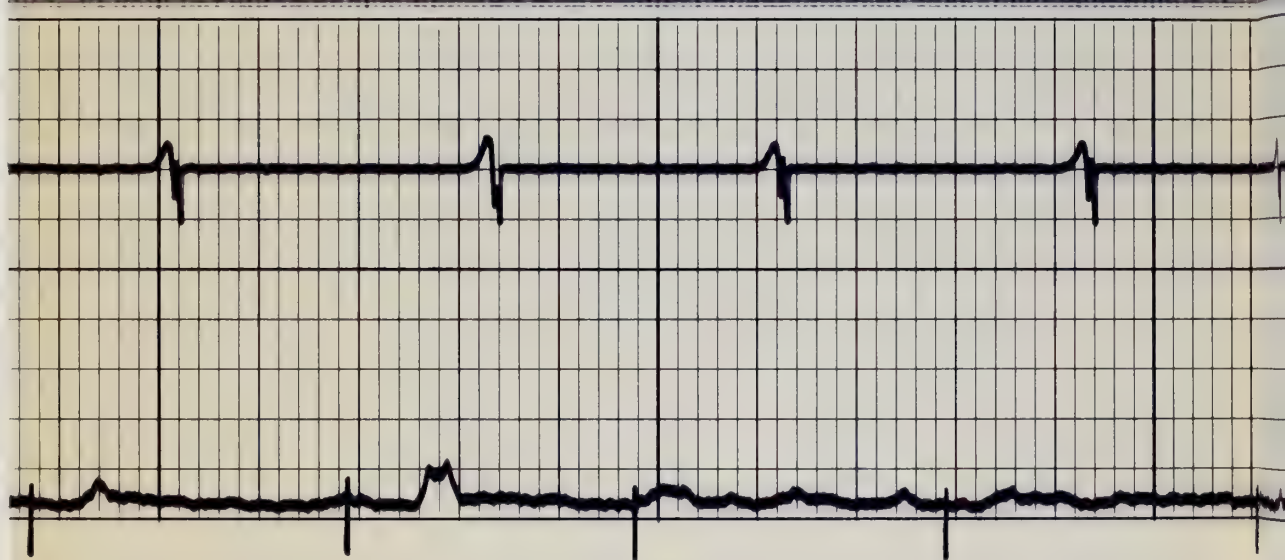
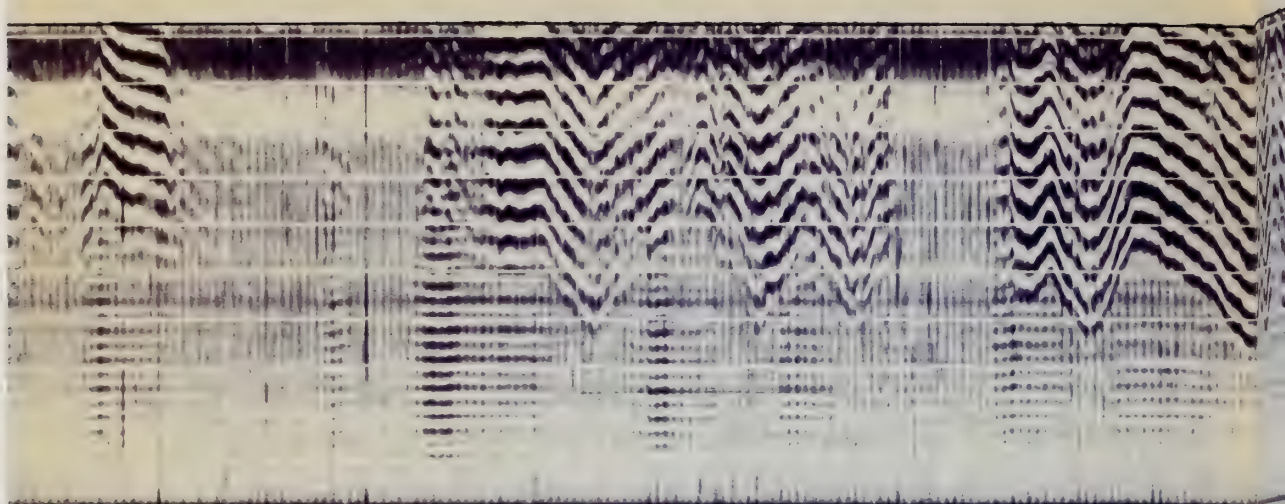
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PERFORATED ONE
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PERFORATED ONE



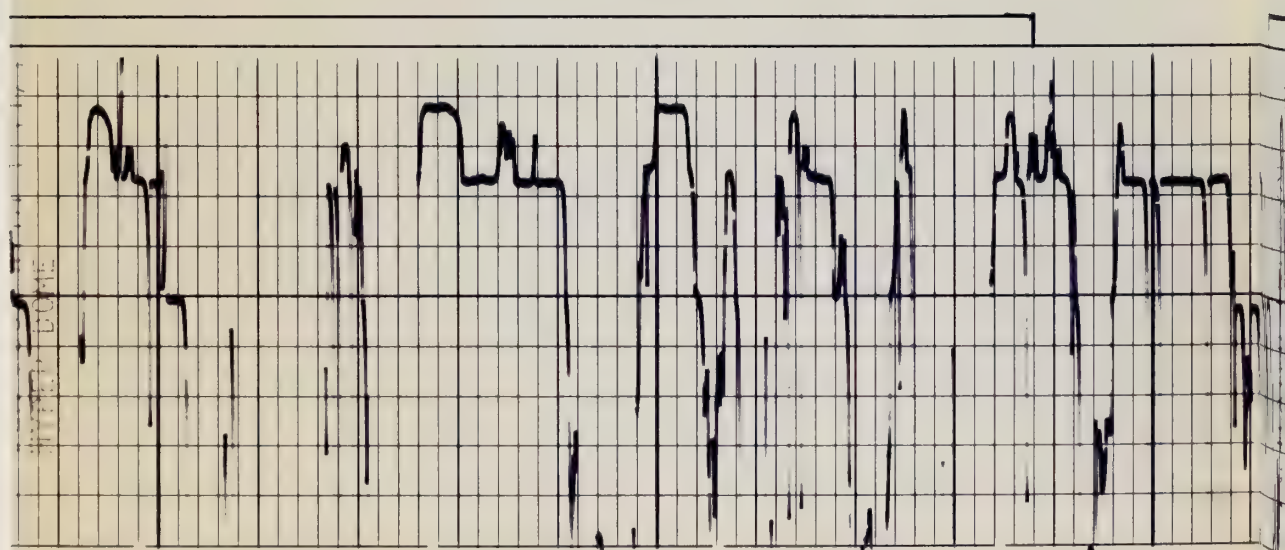
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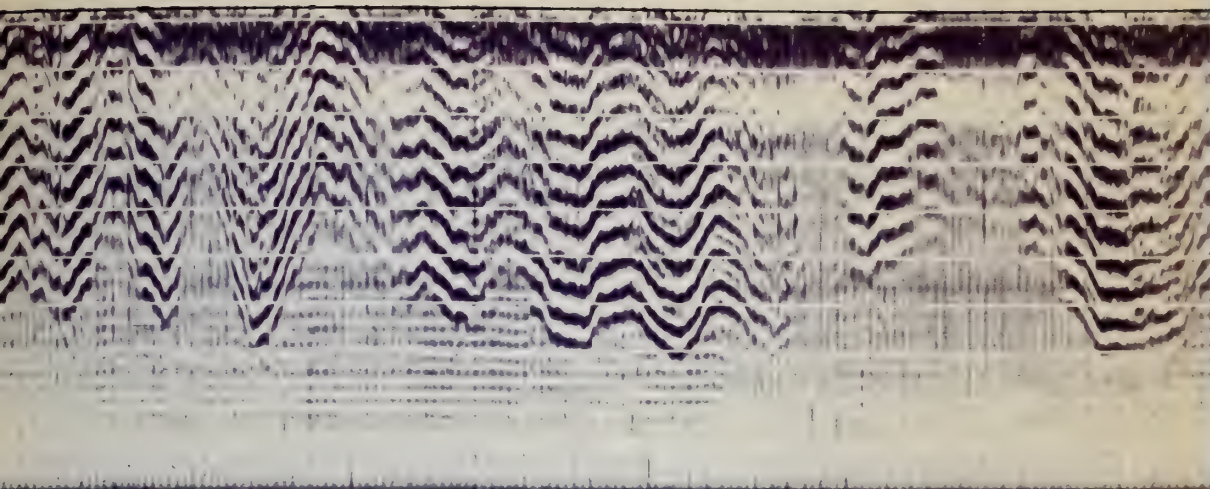


INDICATED INTERVAL
PERFORATED ON 3-4-7

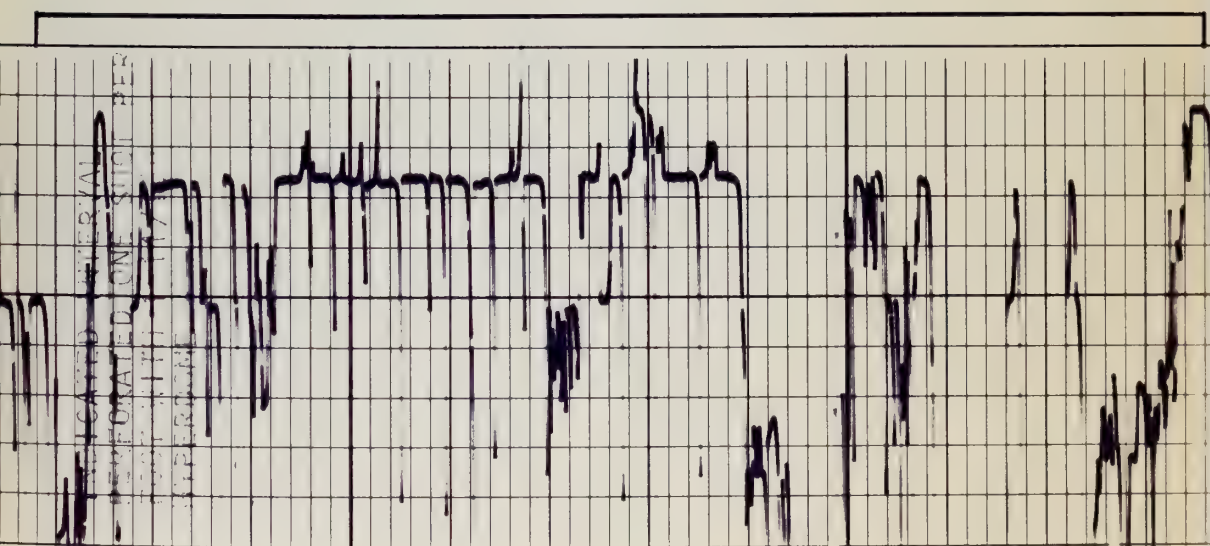


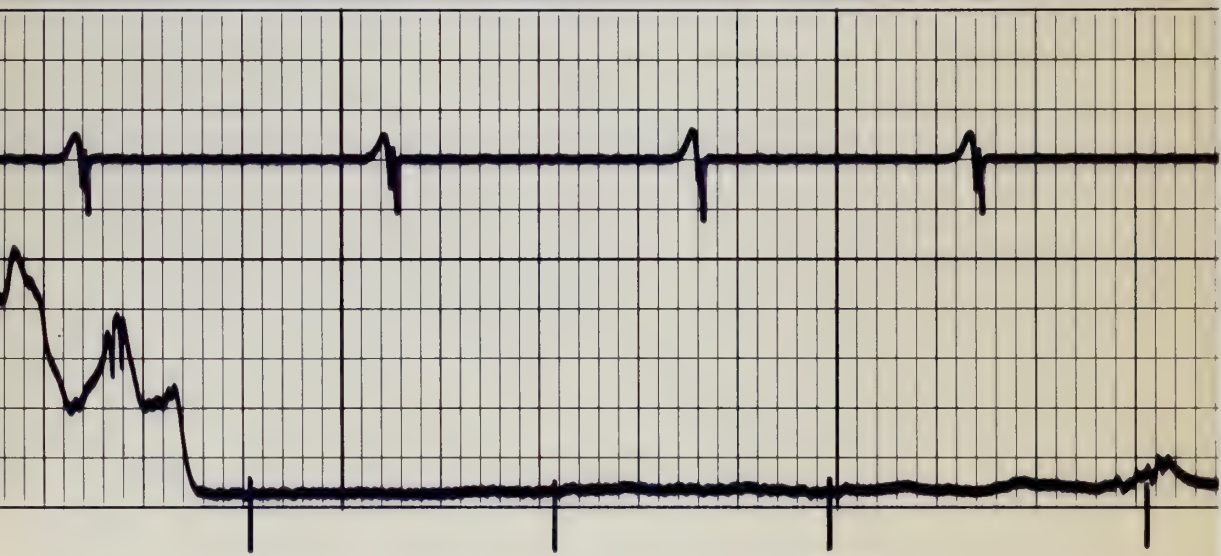
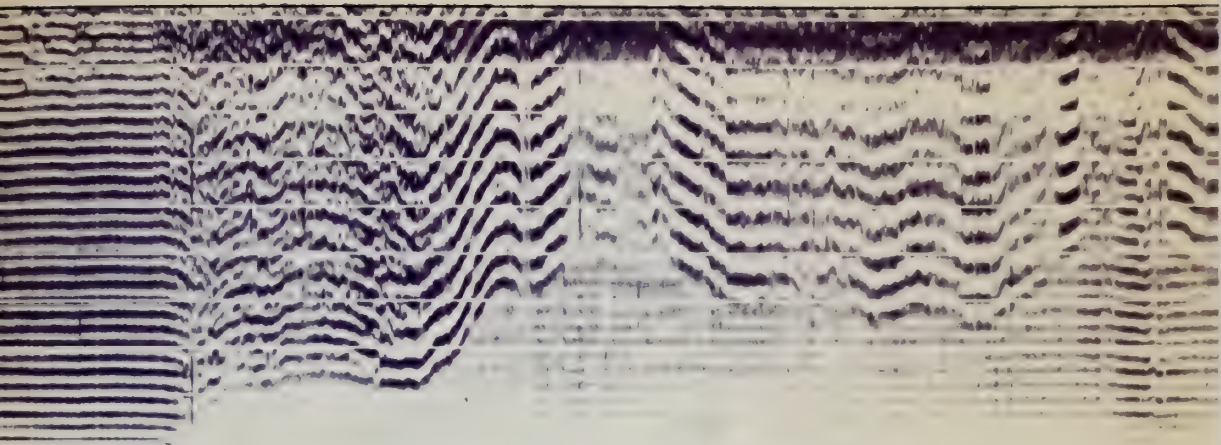
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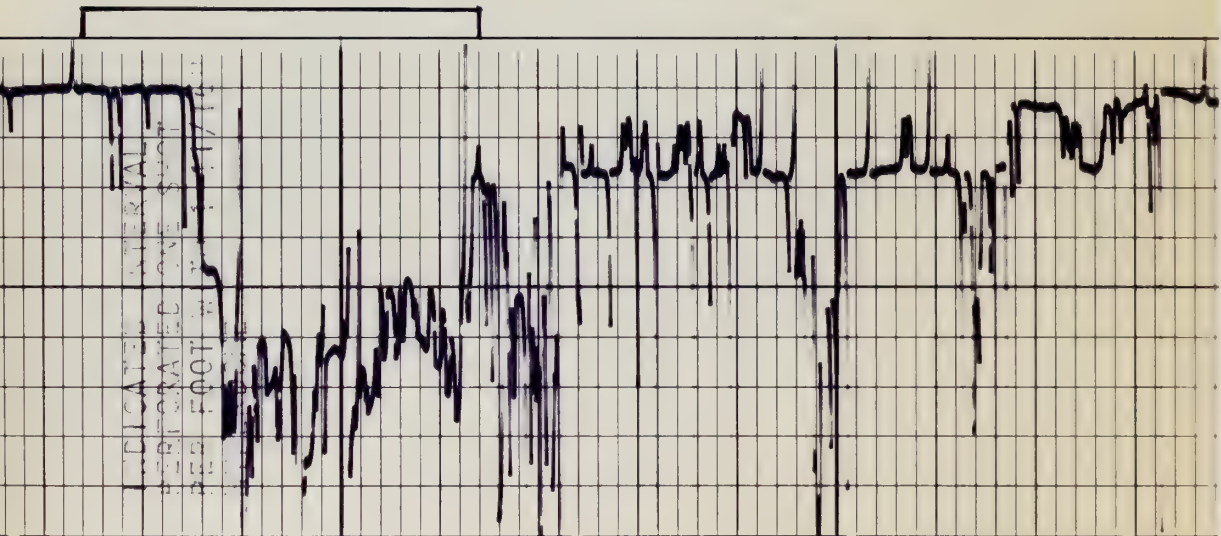


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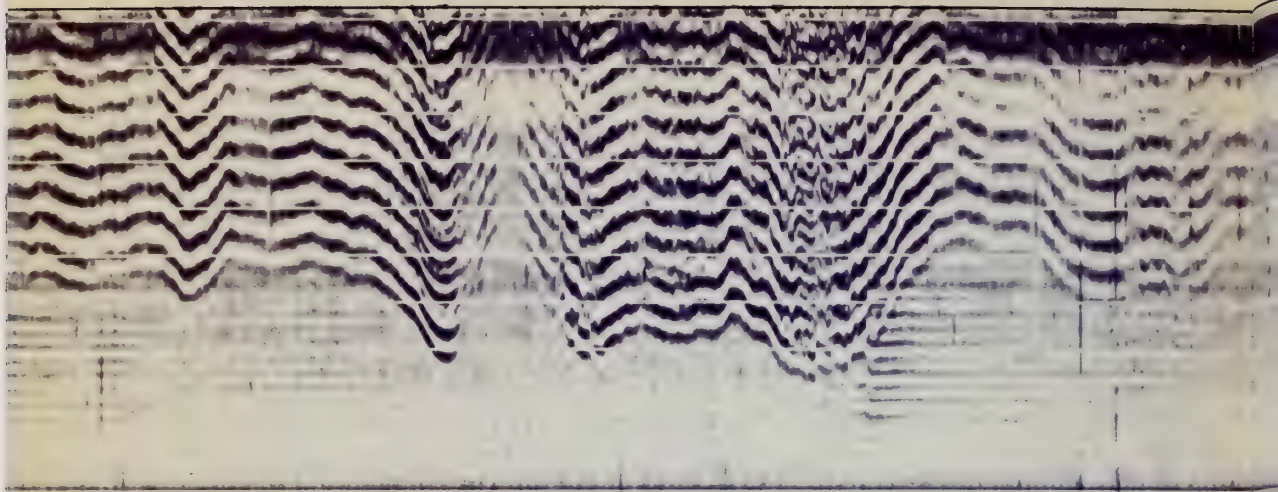




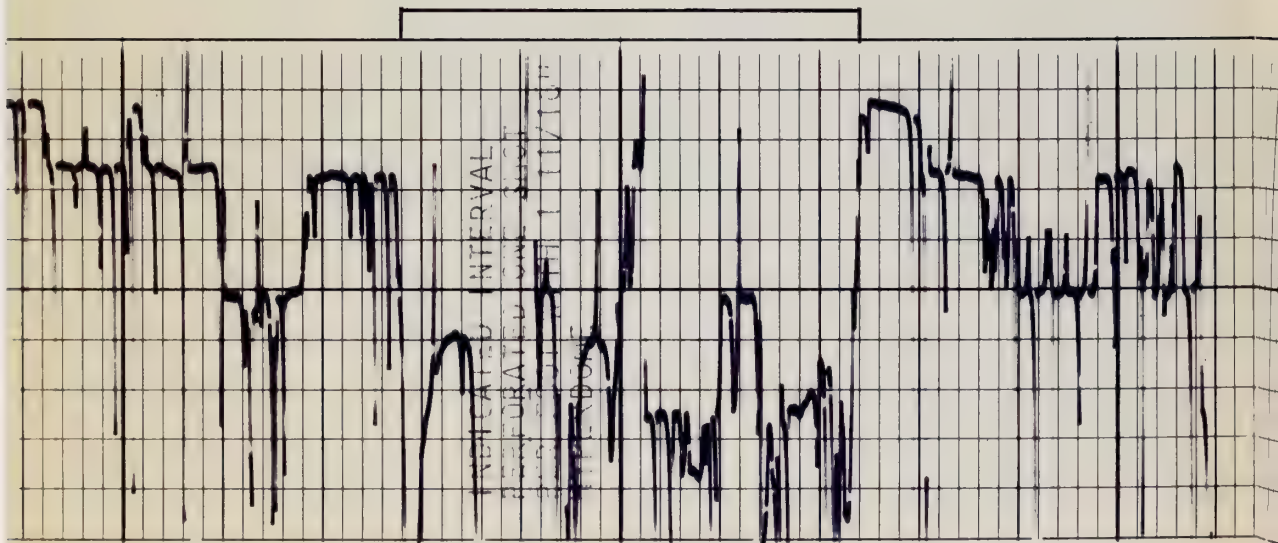
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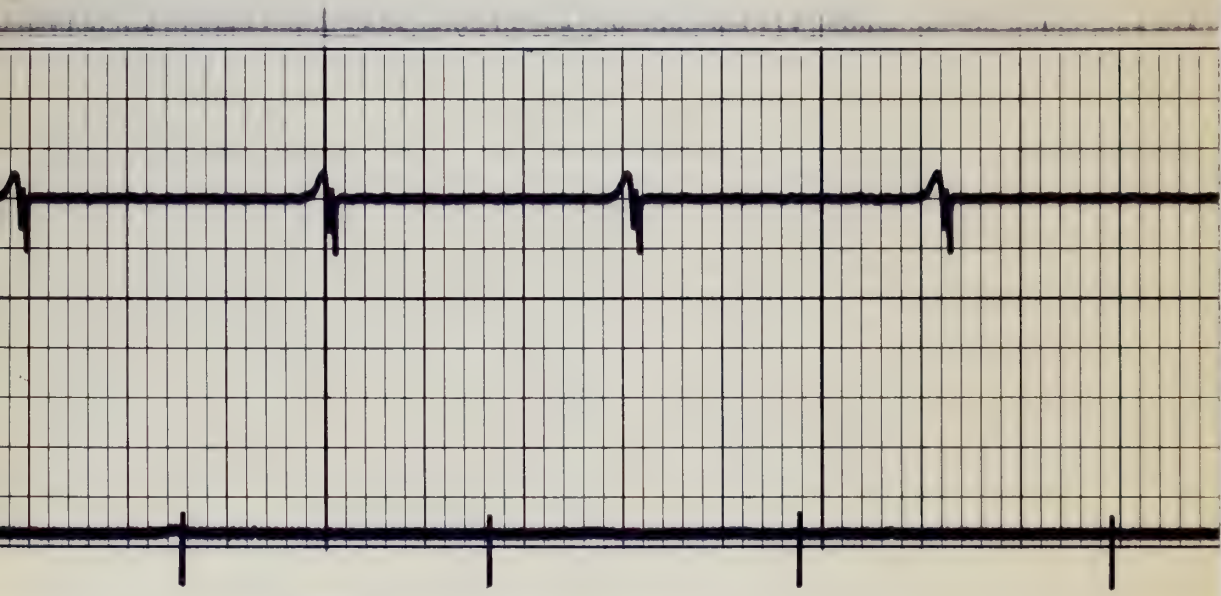
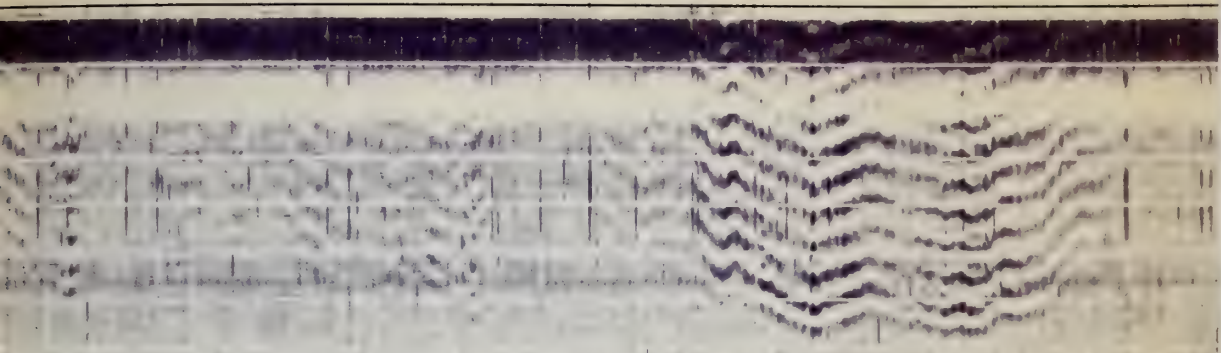


INDICATED INTERVAL
PERFORATED ONE FOOT
PER FOOT

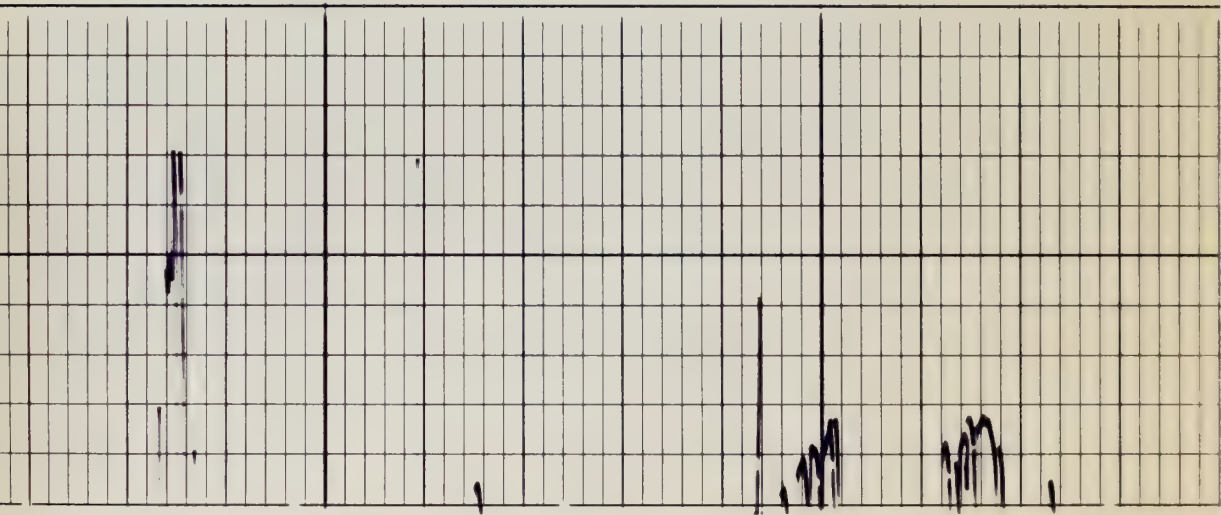


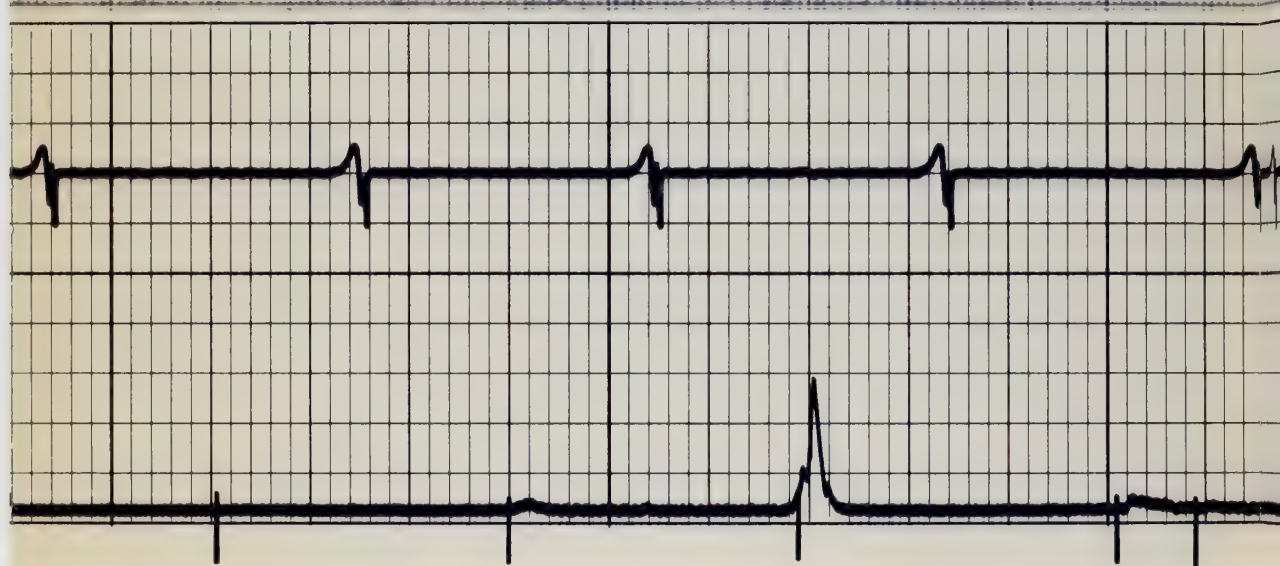
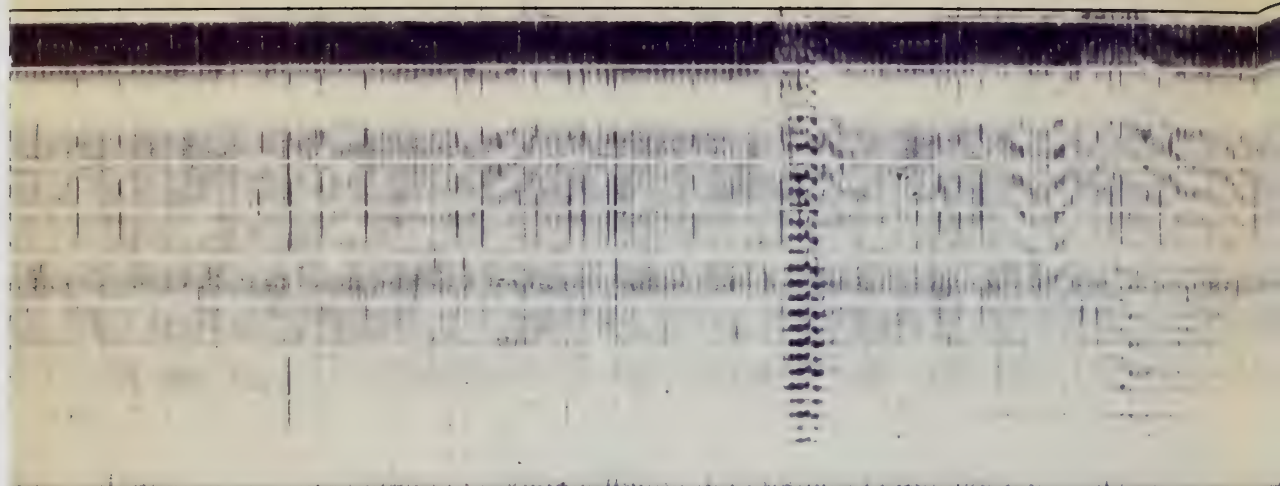
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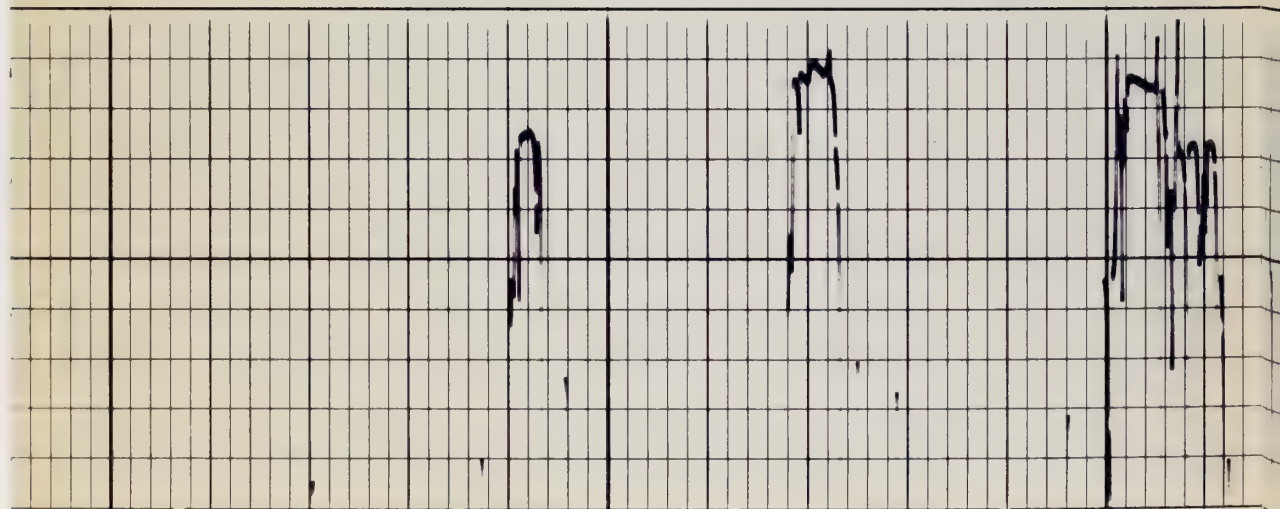
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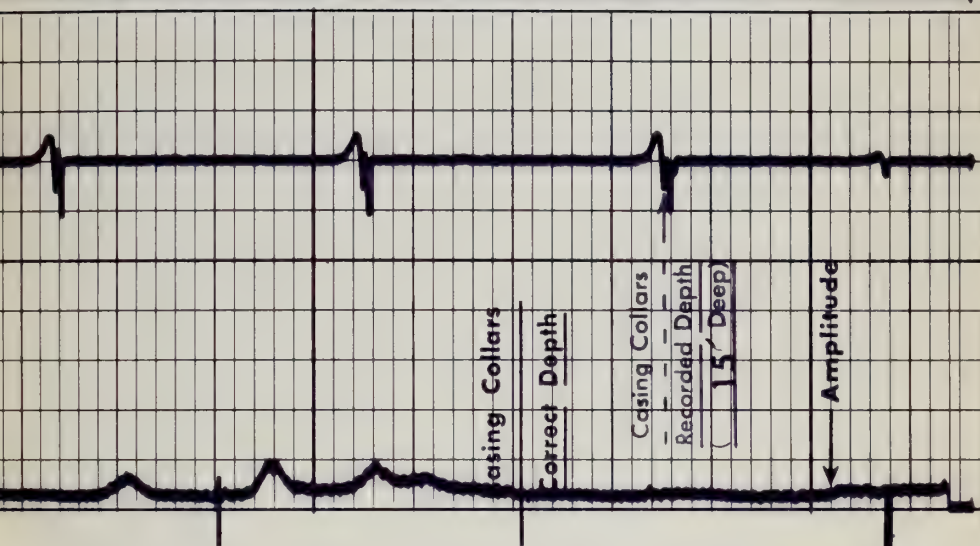
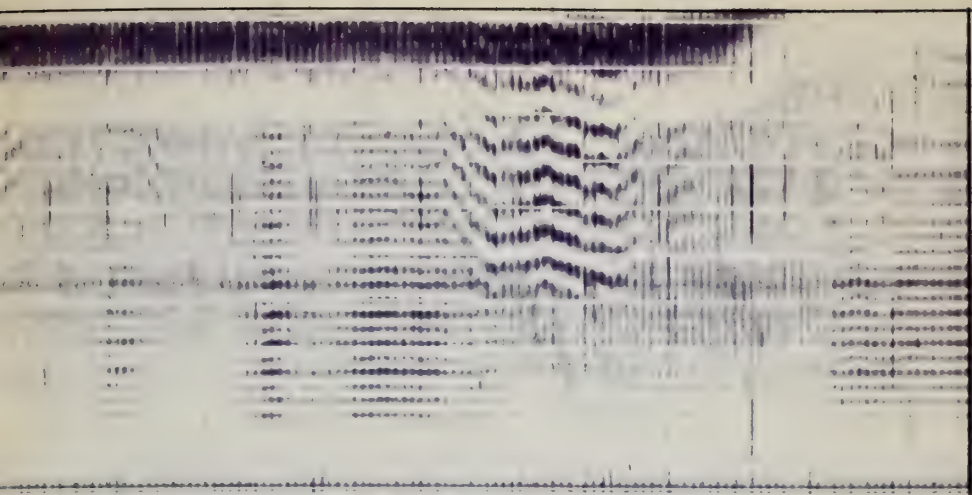




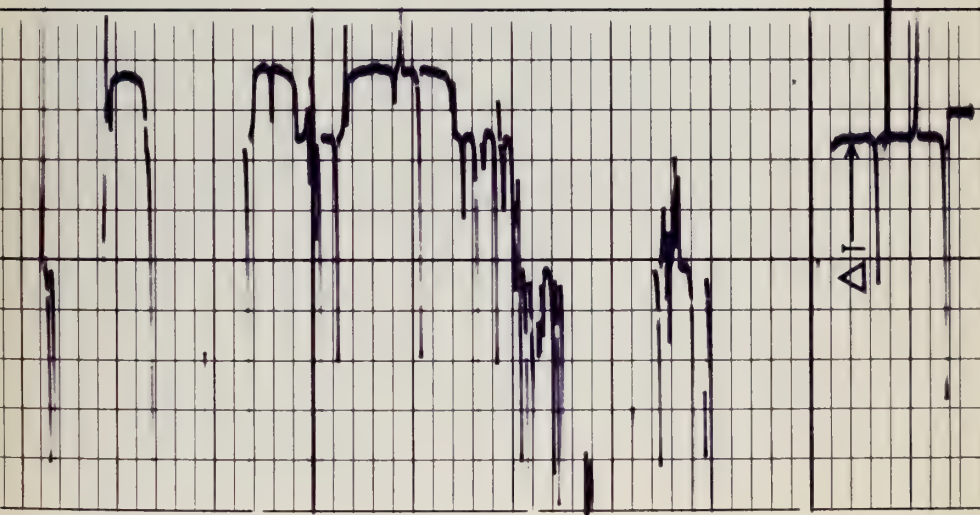
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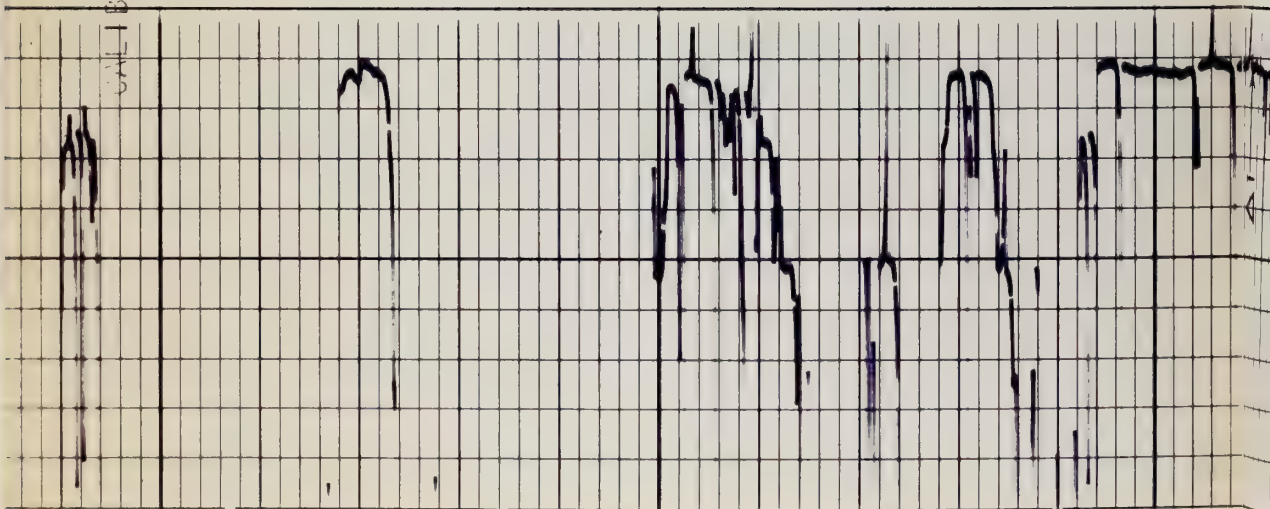
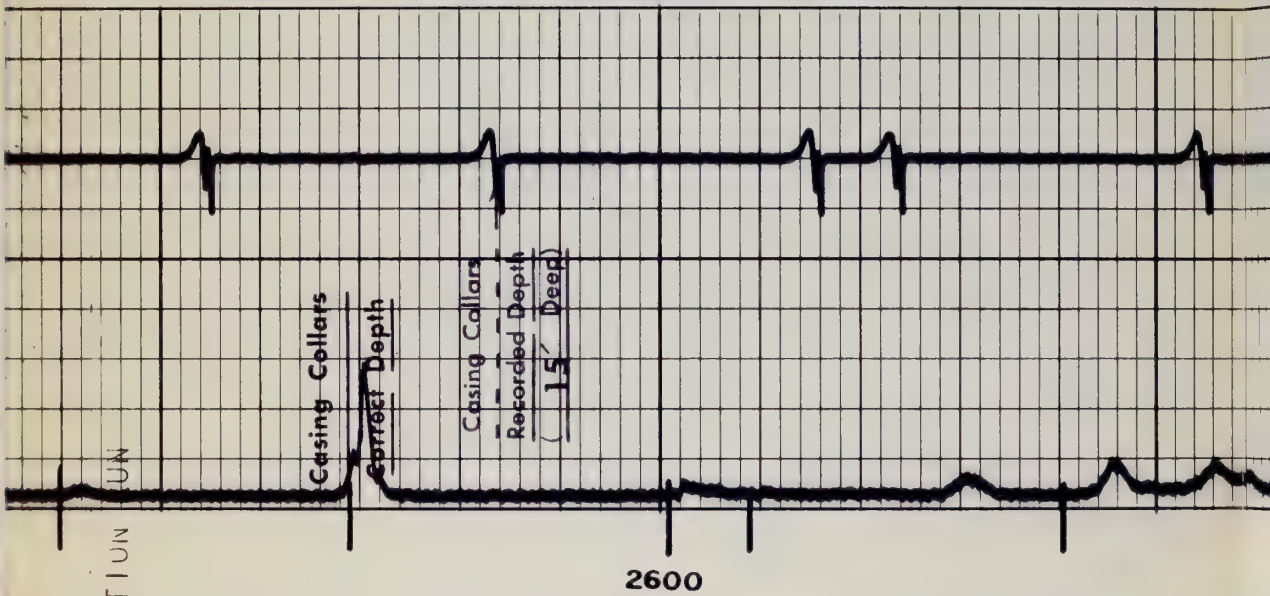
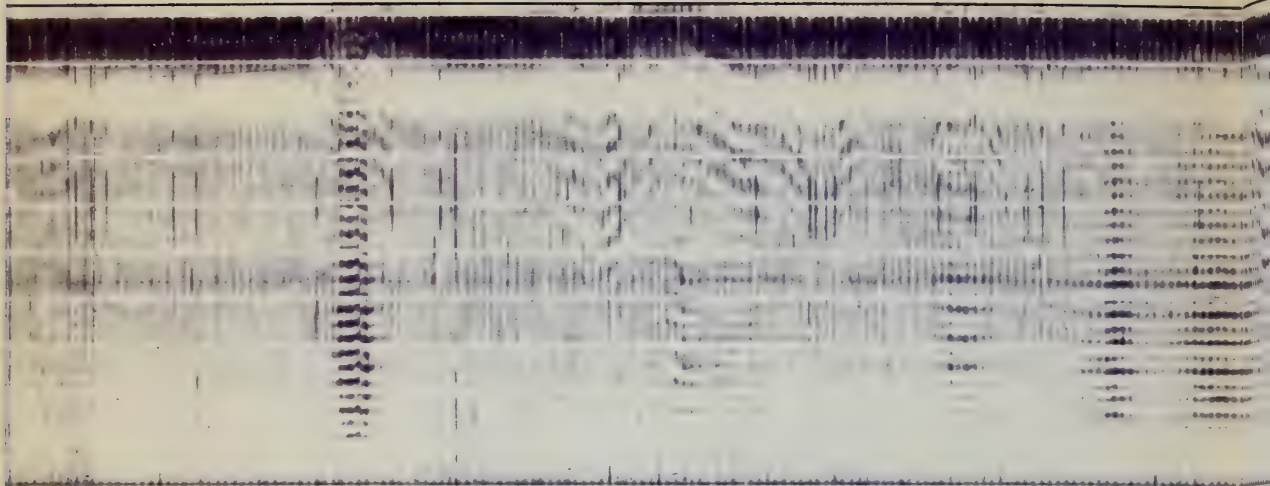
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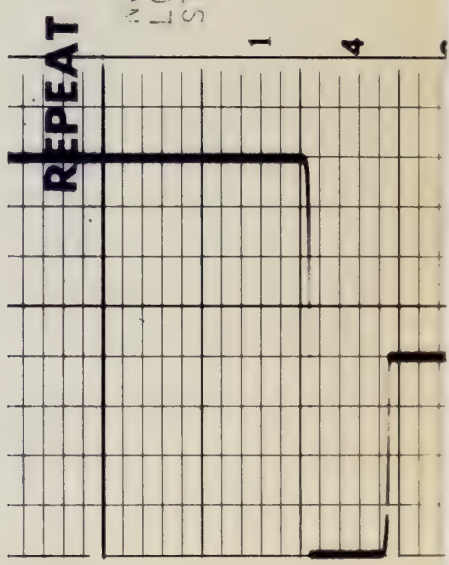
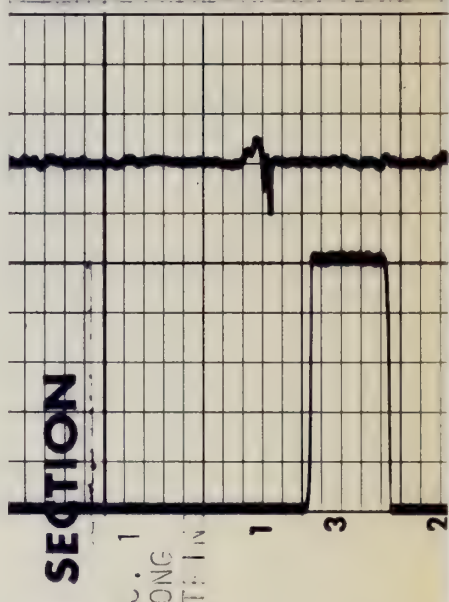
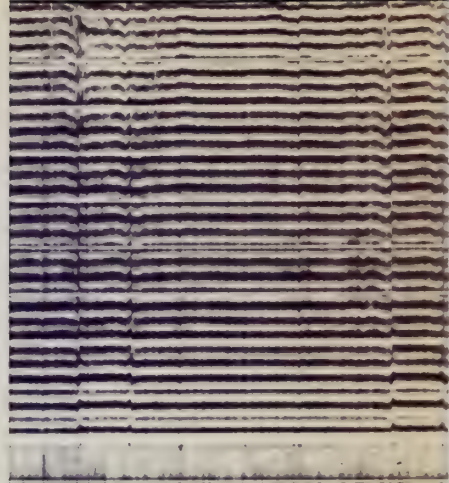
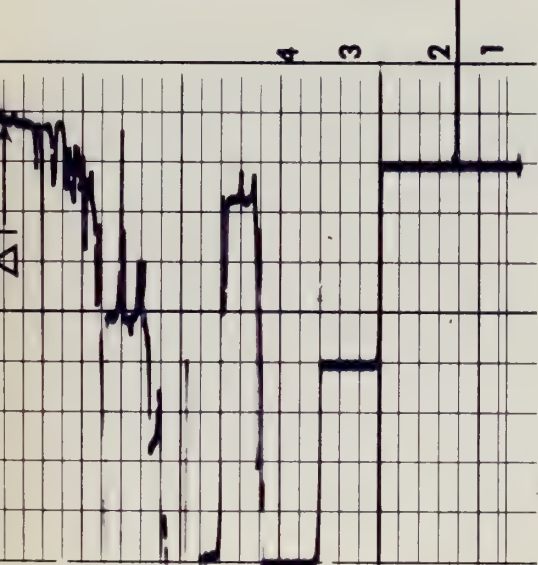
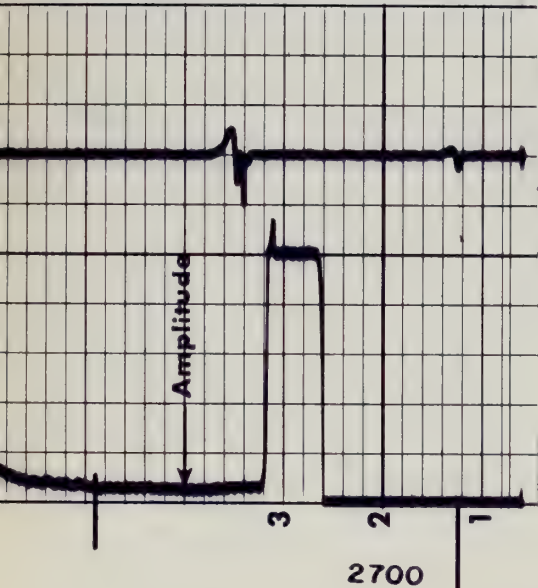
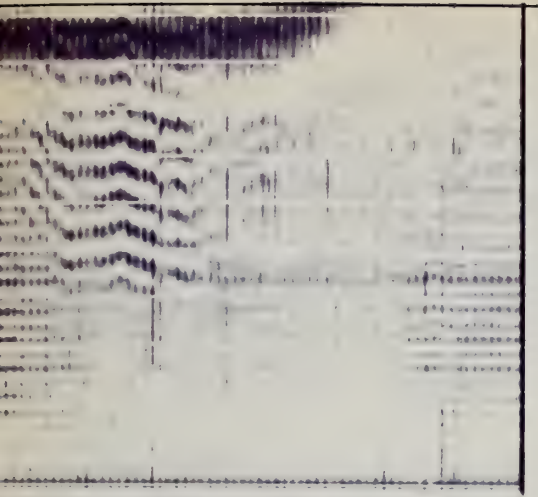




2700 FR

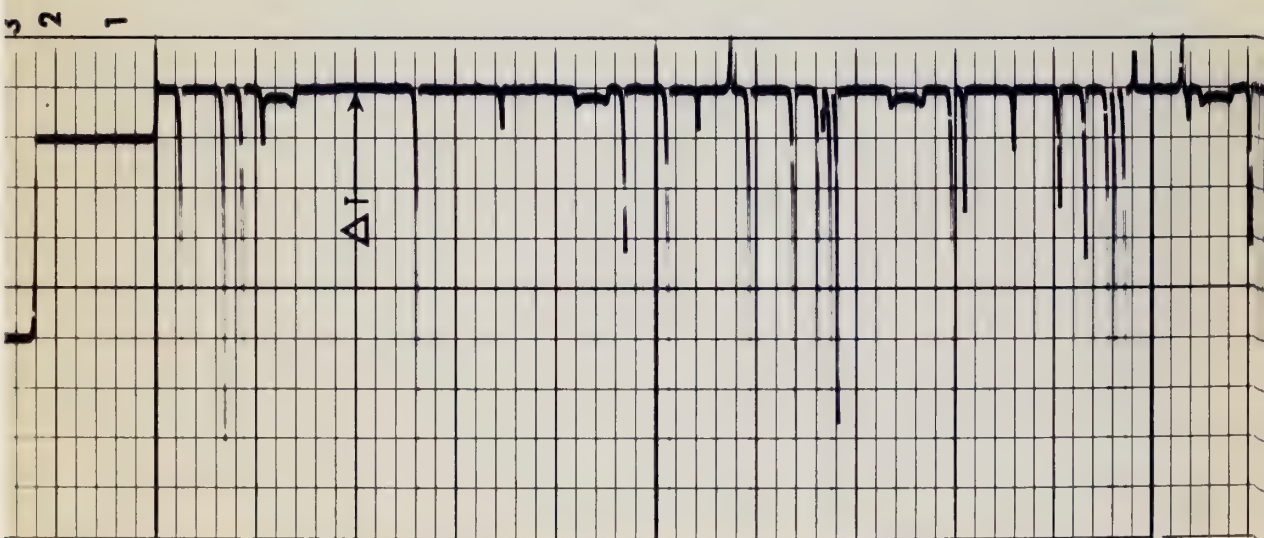
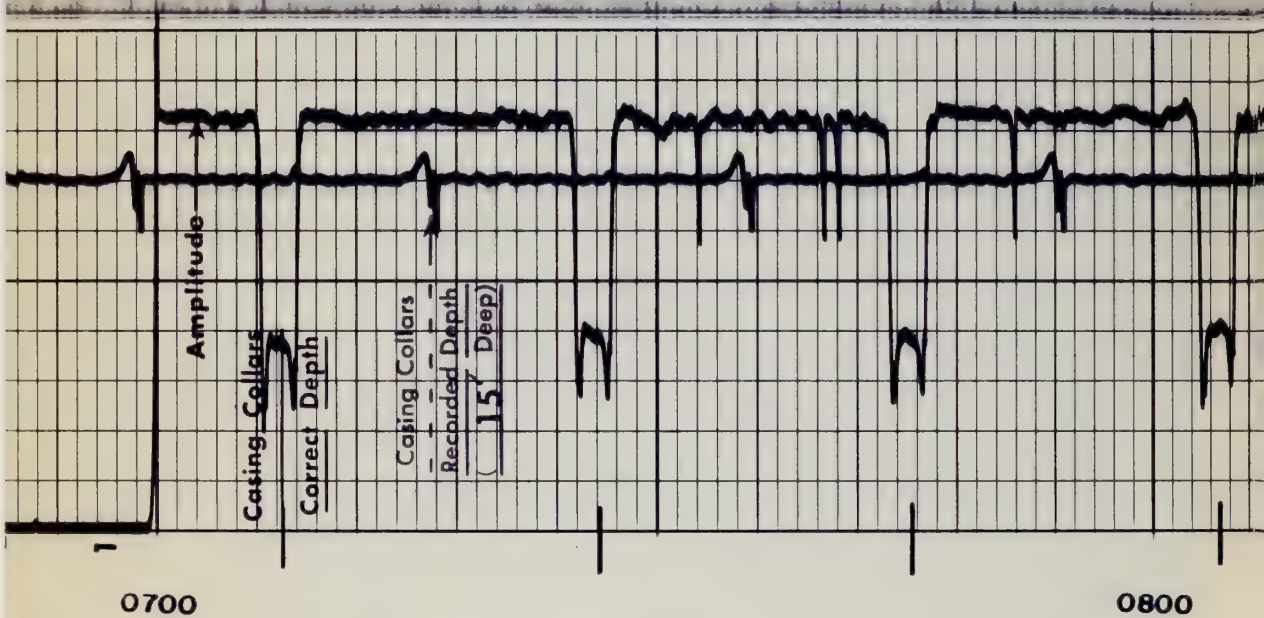
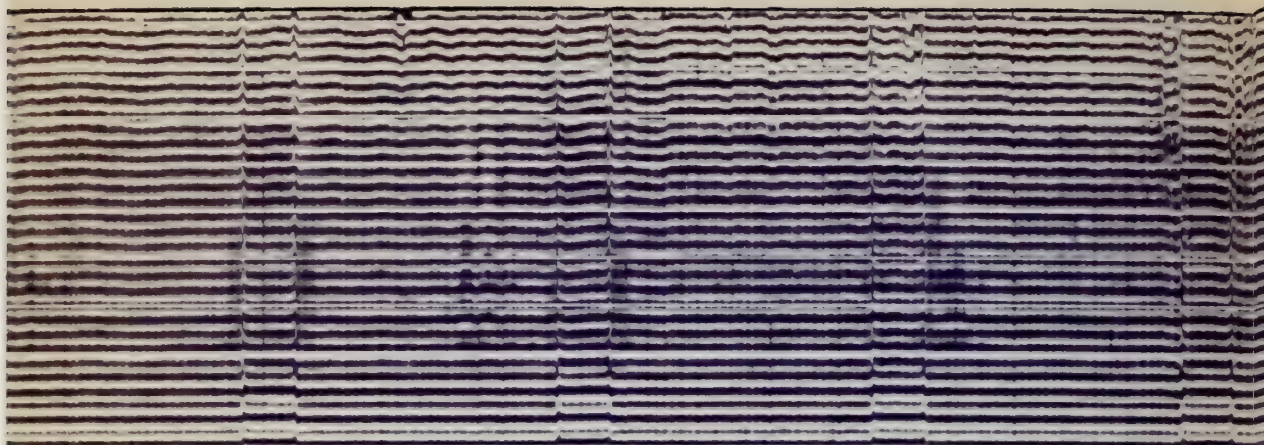


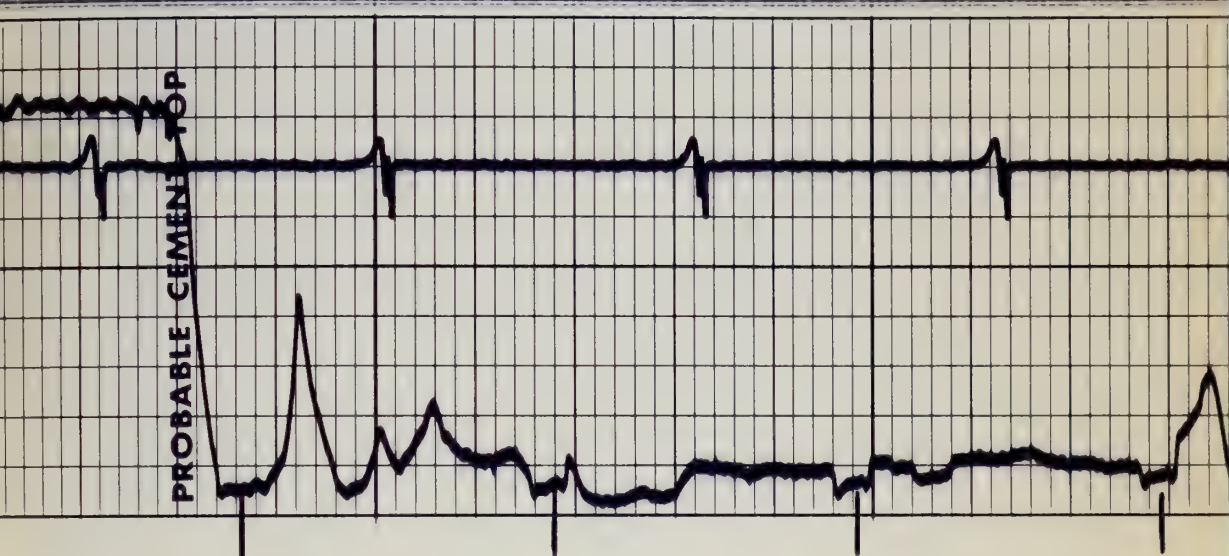
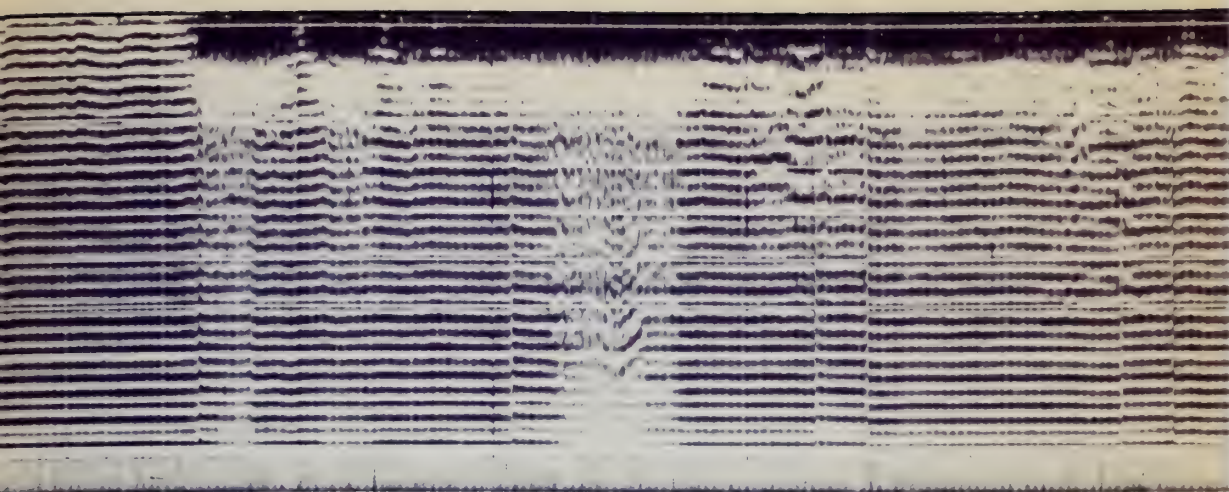




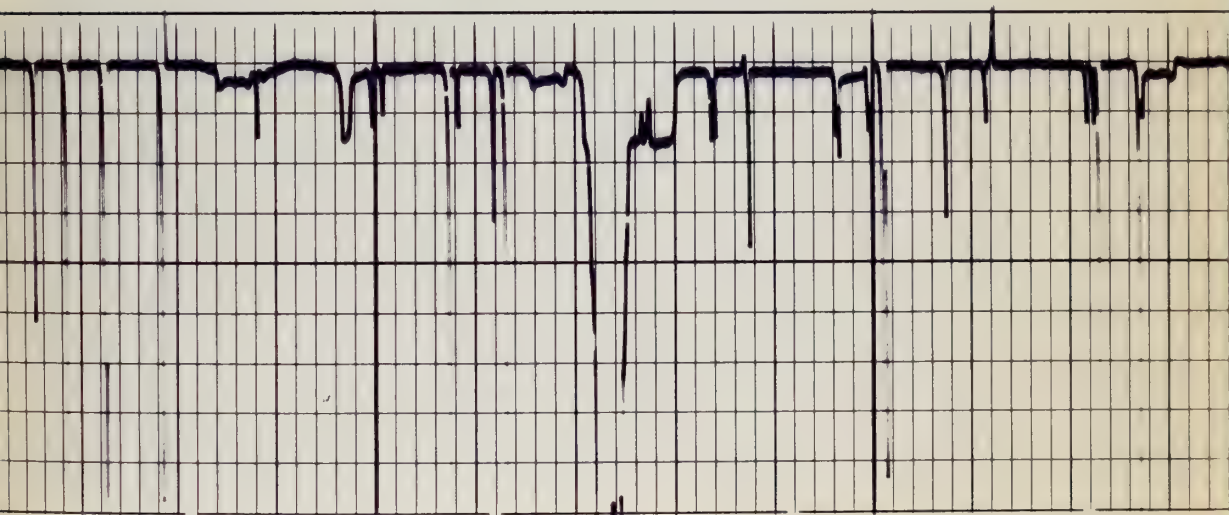
REPEAT SECTION

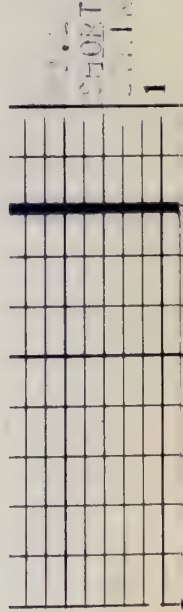
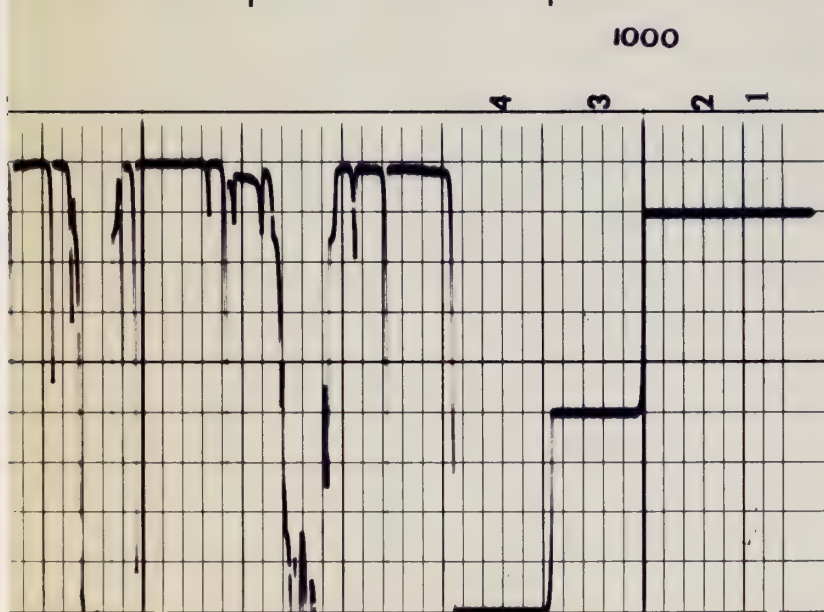
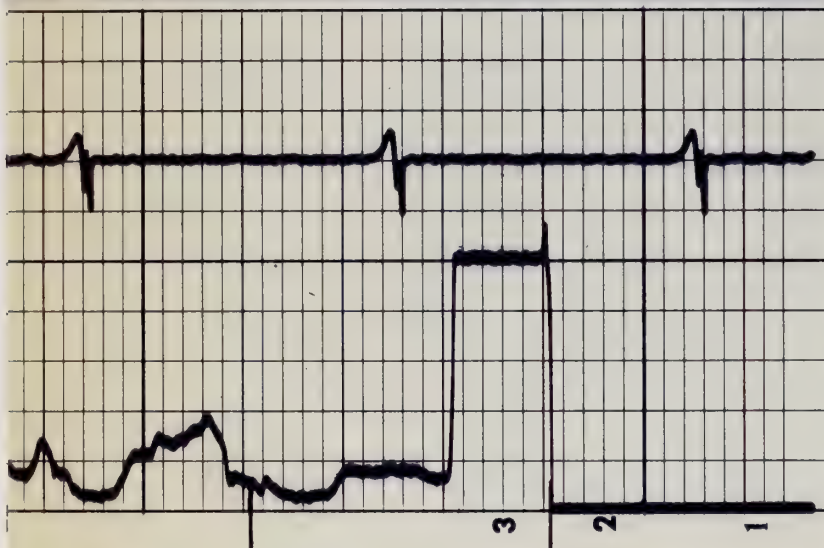
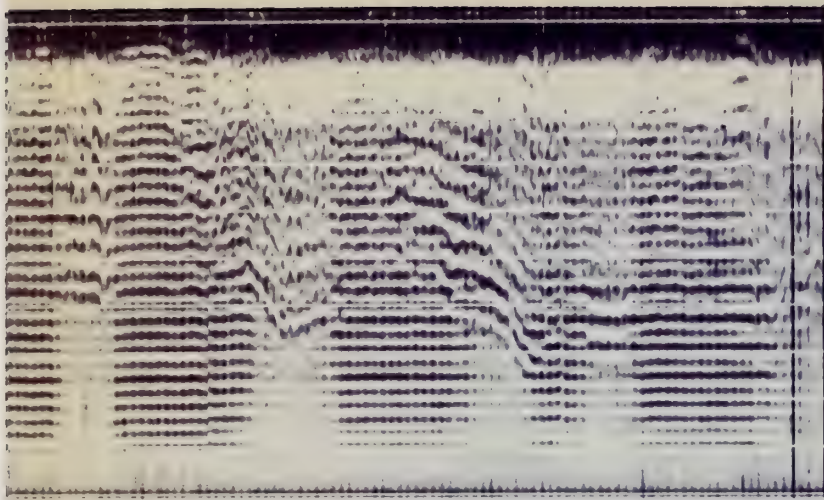
NO. 1
LONG
STRAIN

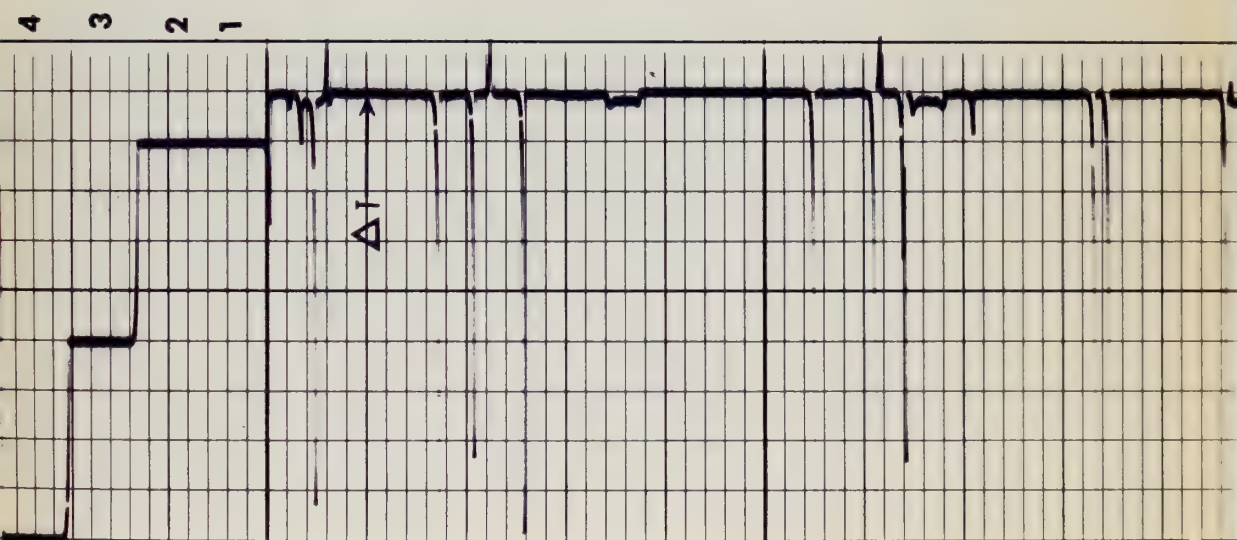
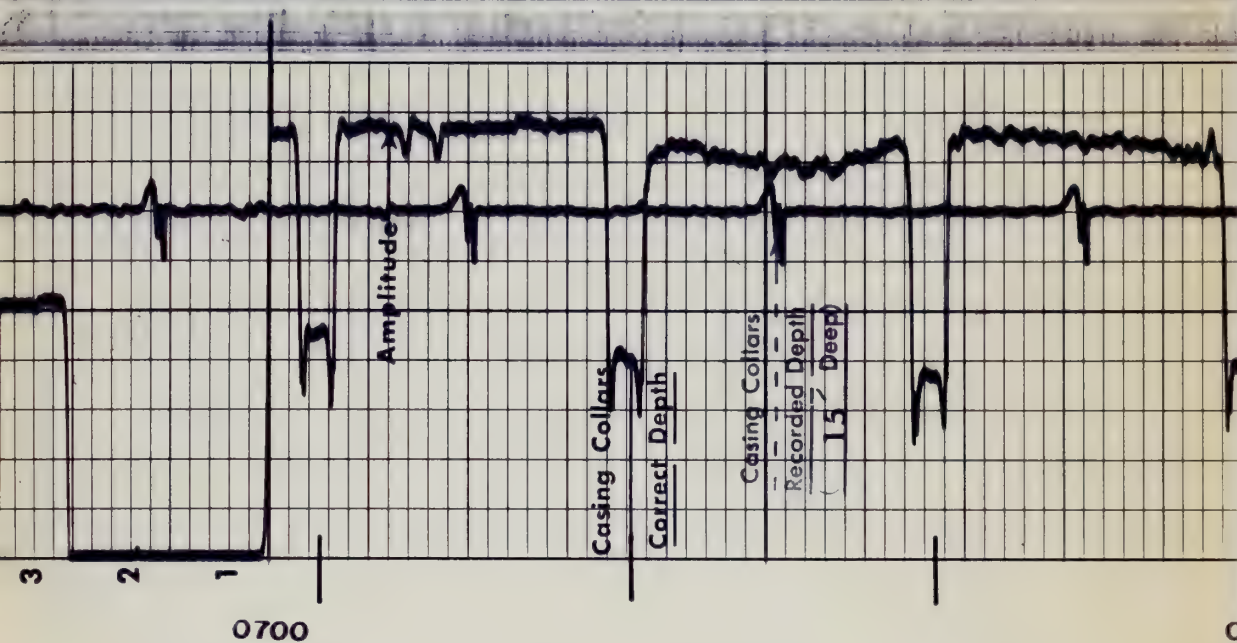
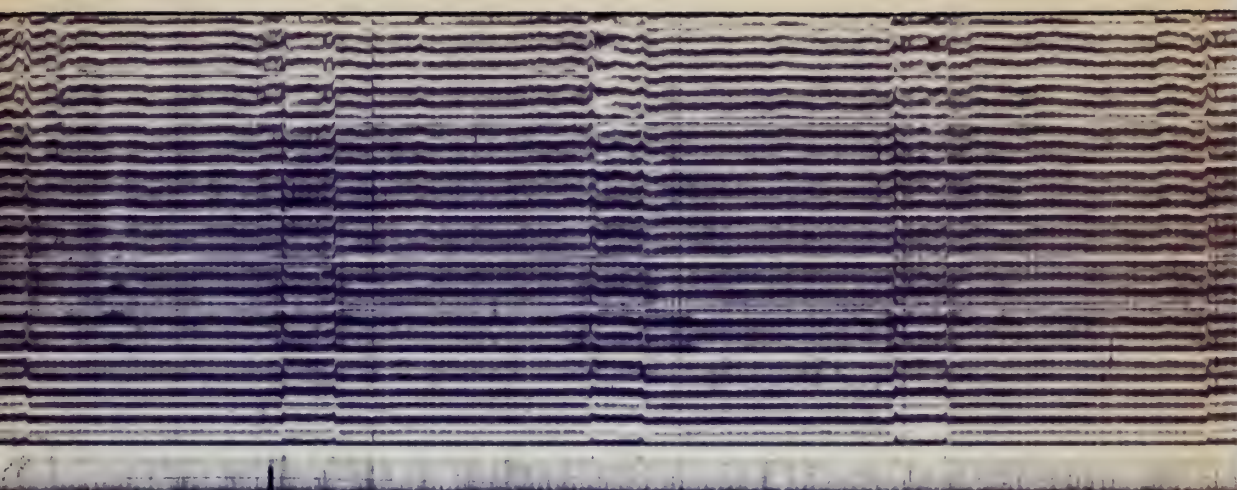


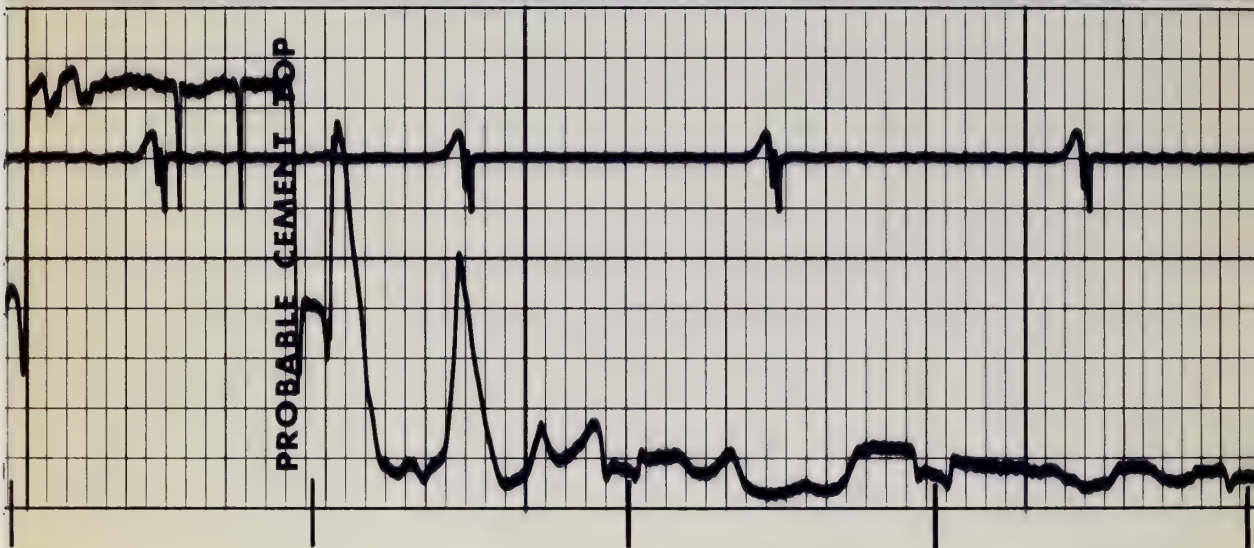
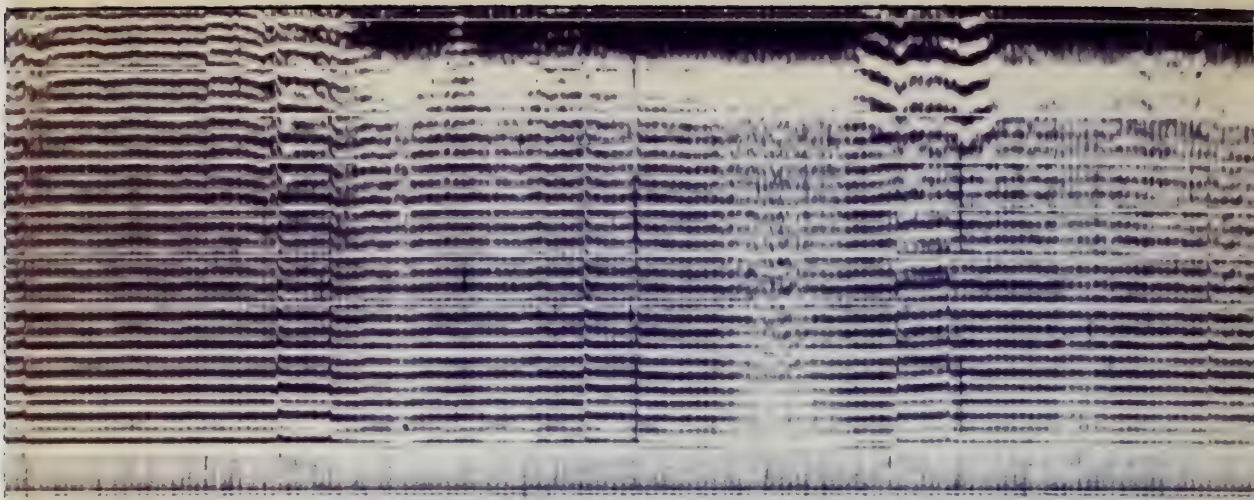


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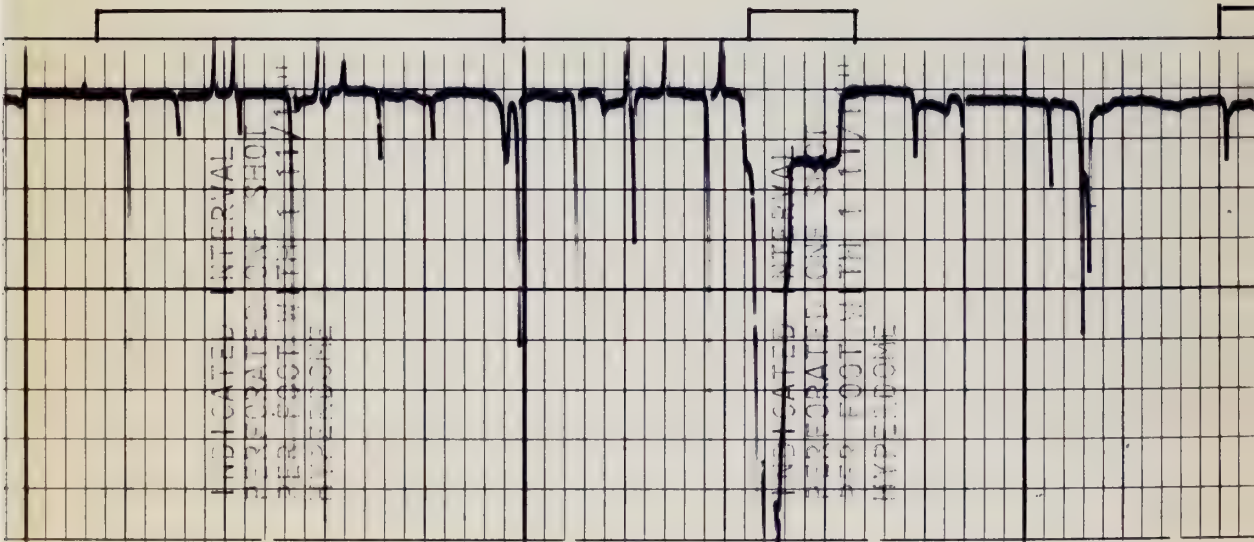


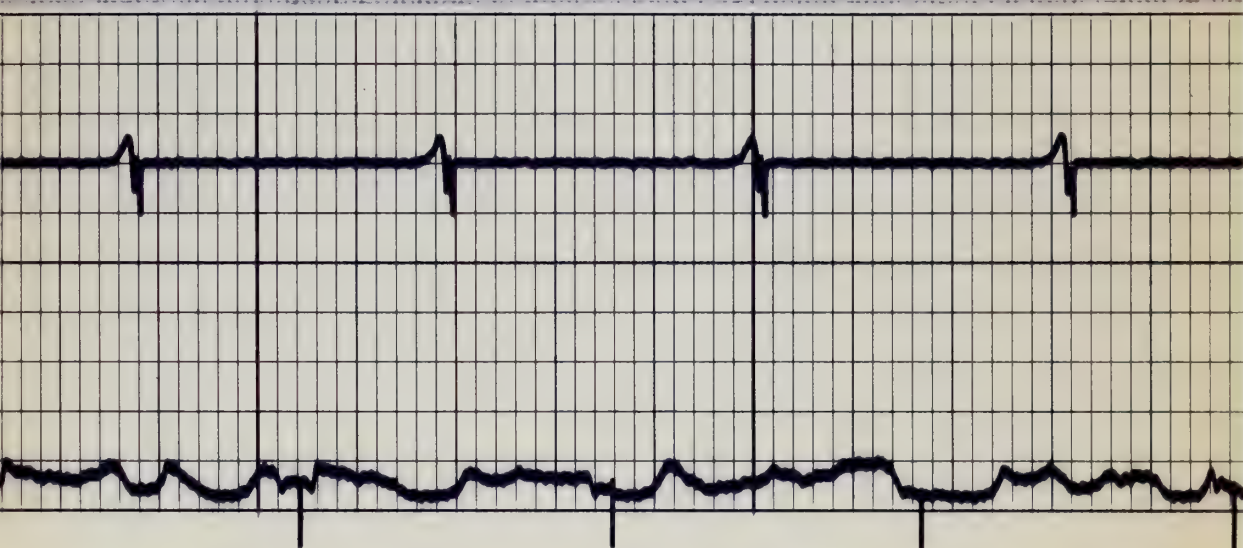
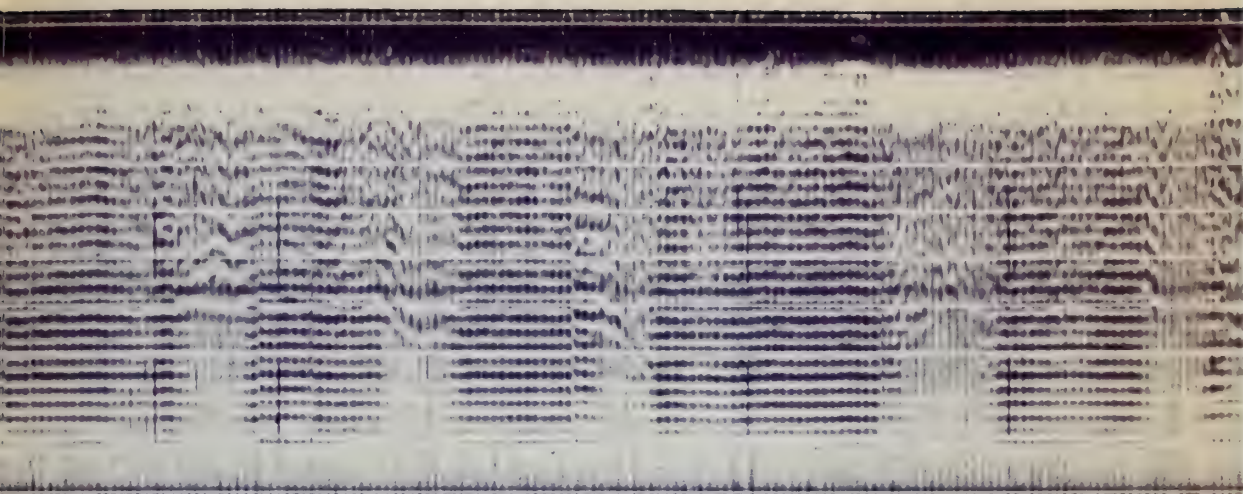




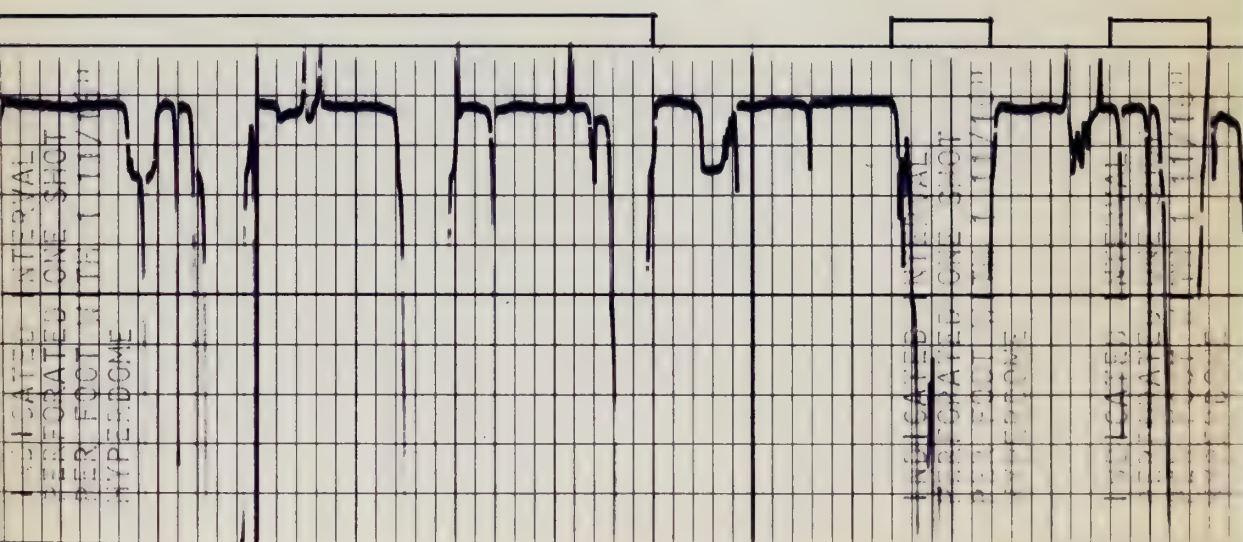
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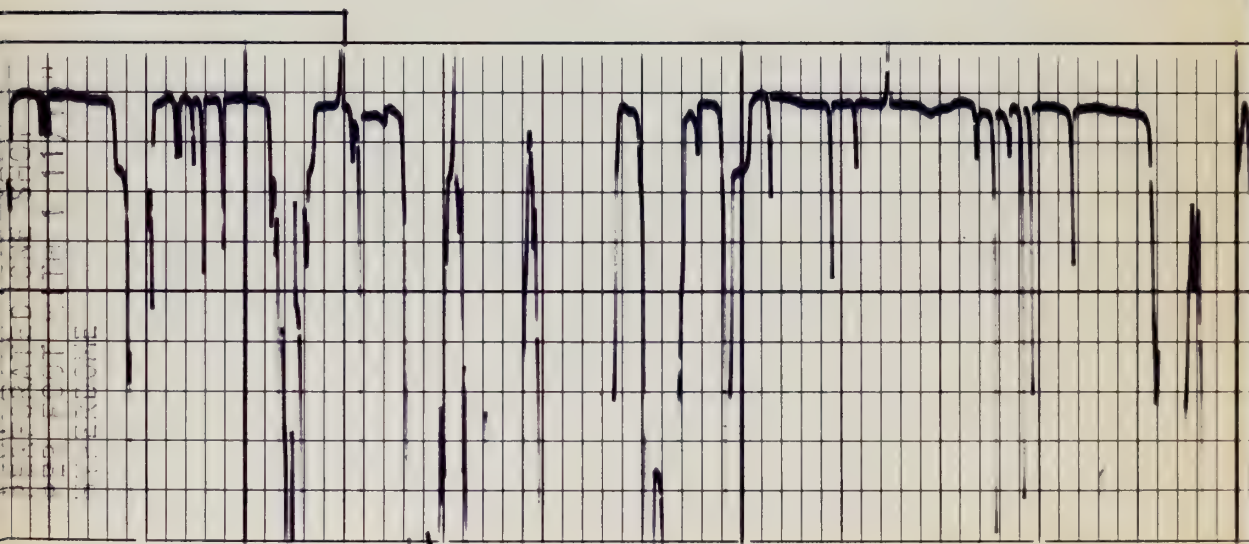
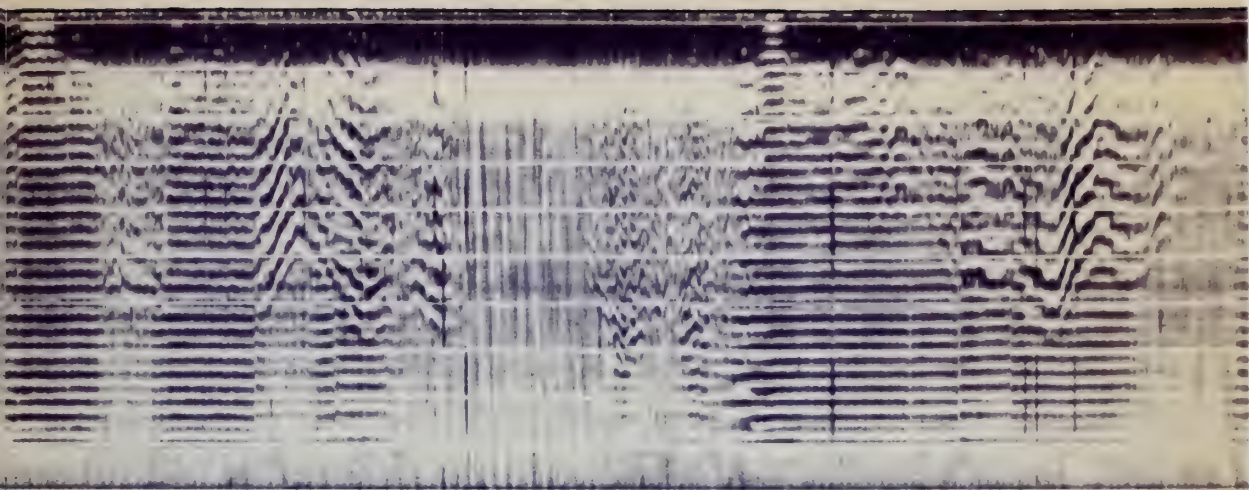
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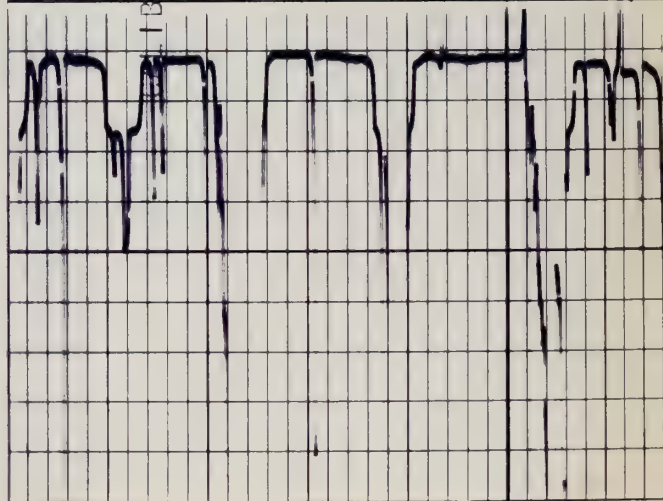
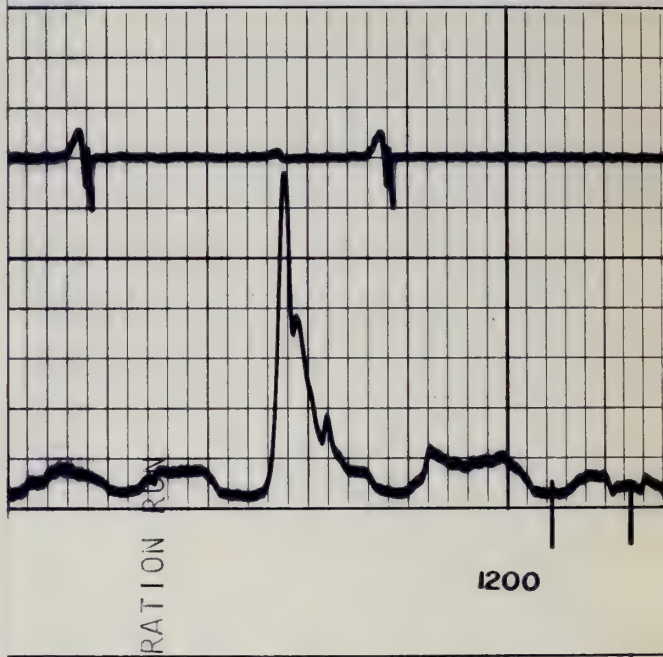
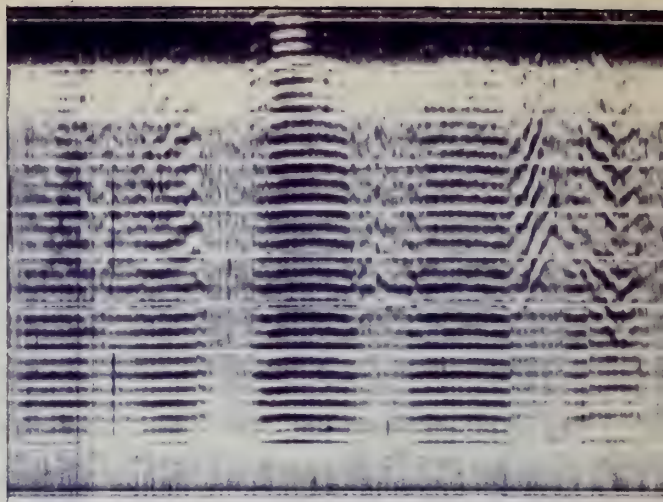
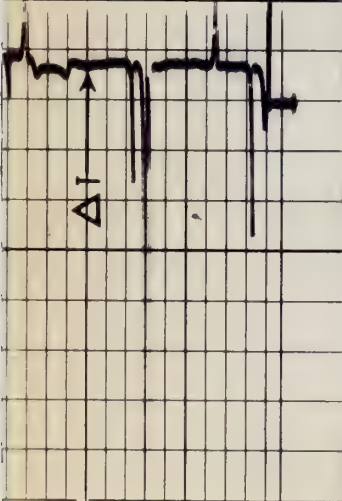
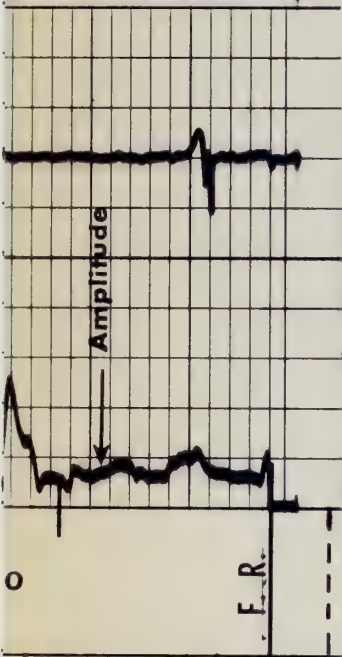
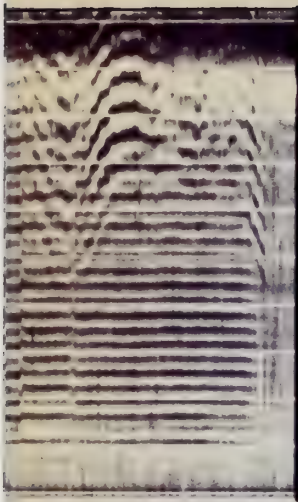




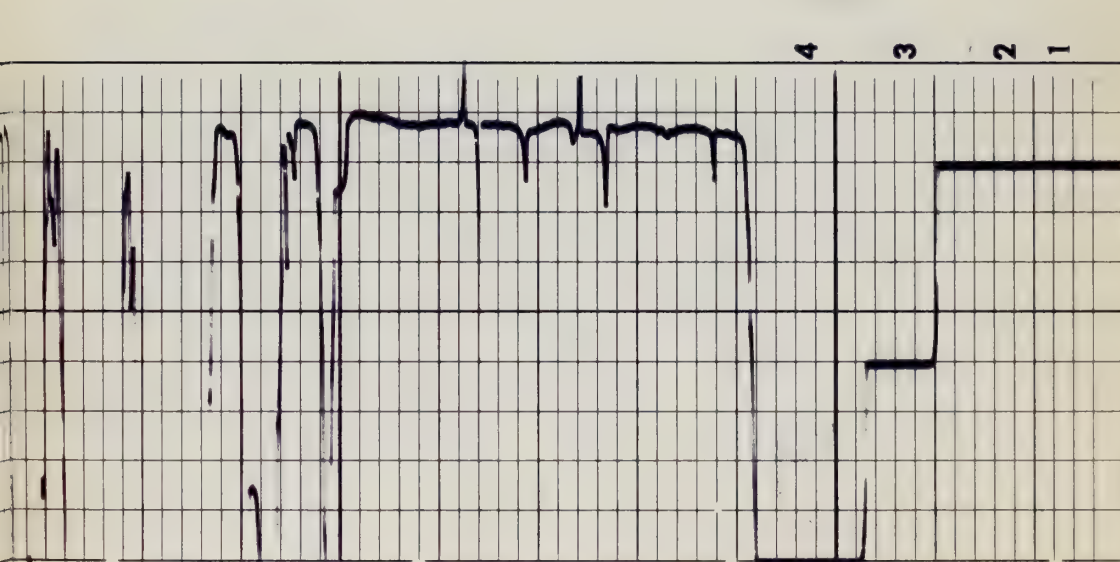
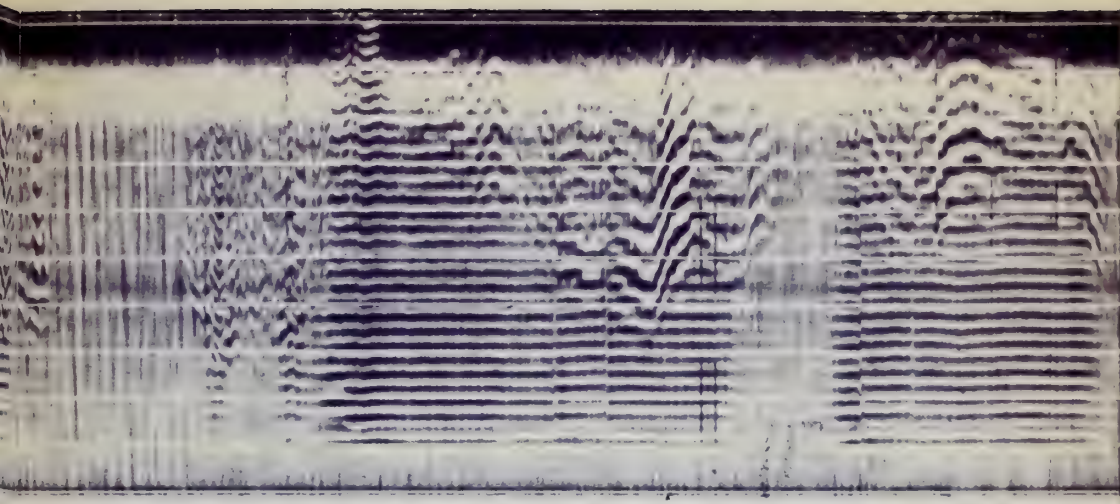
1000







1200



REPEAT SECTION

NO. 2 Casing String

1 4 3 2 1

0700

ΔT

Amplitude

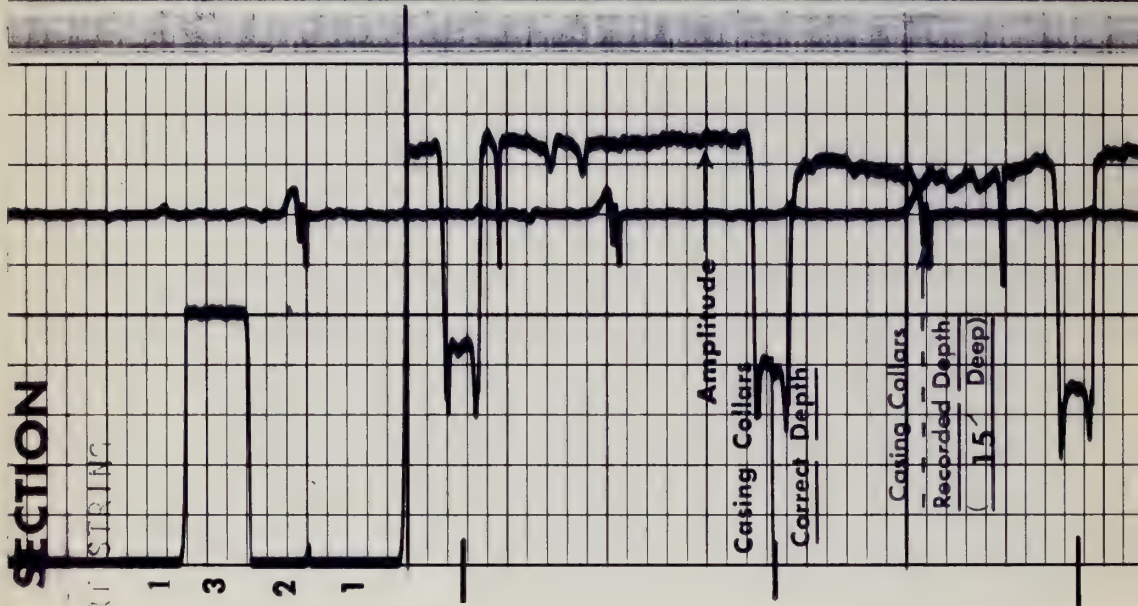
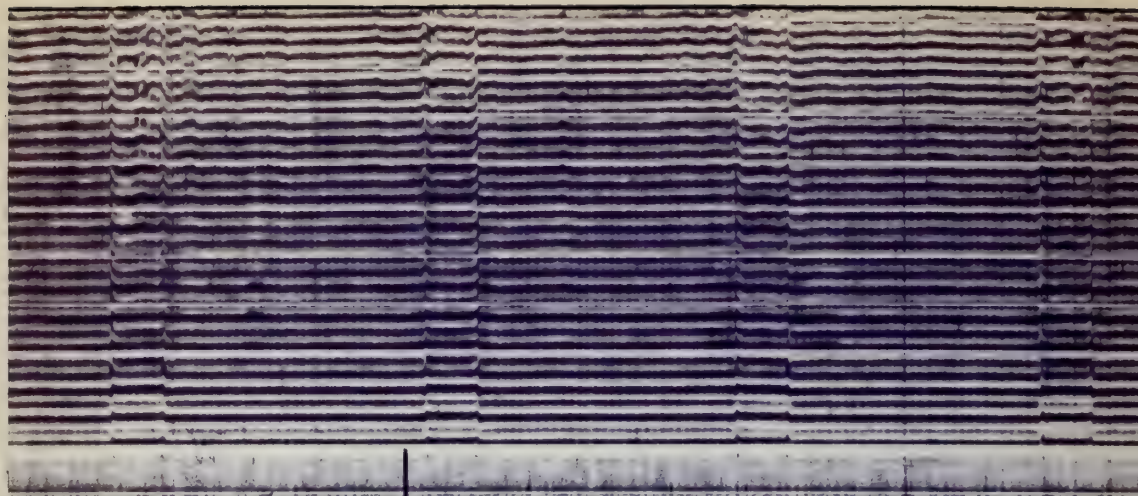
Casing Collars

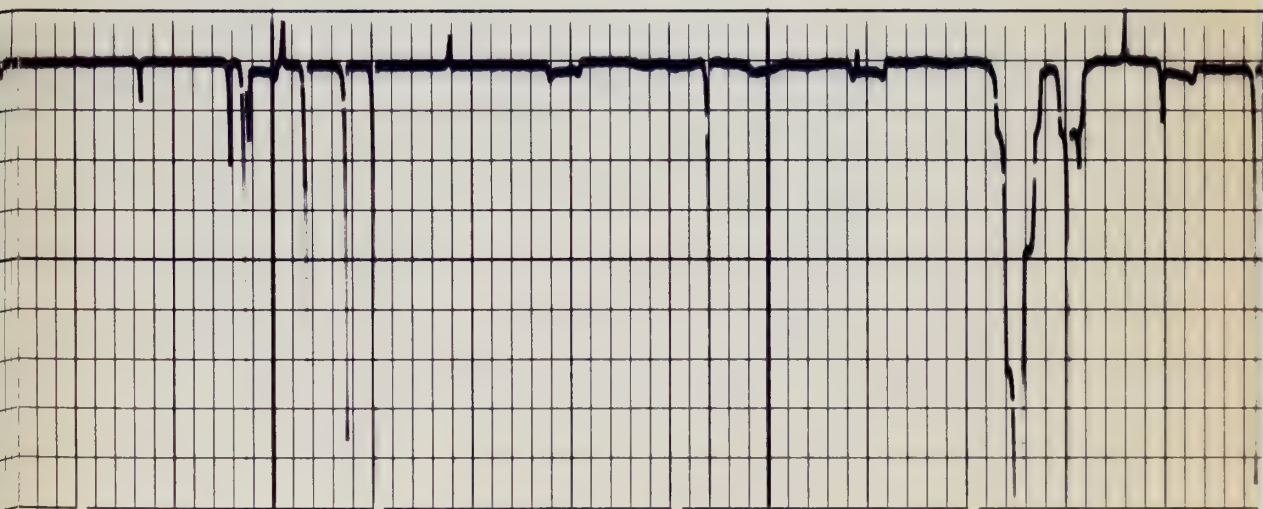
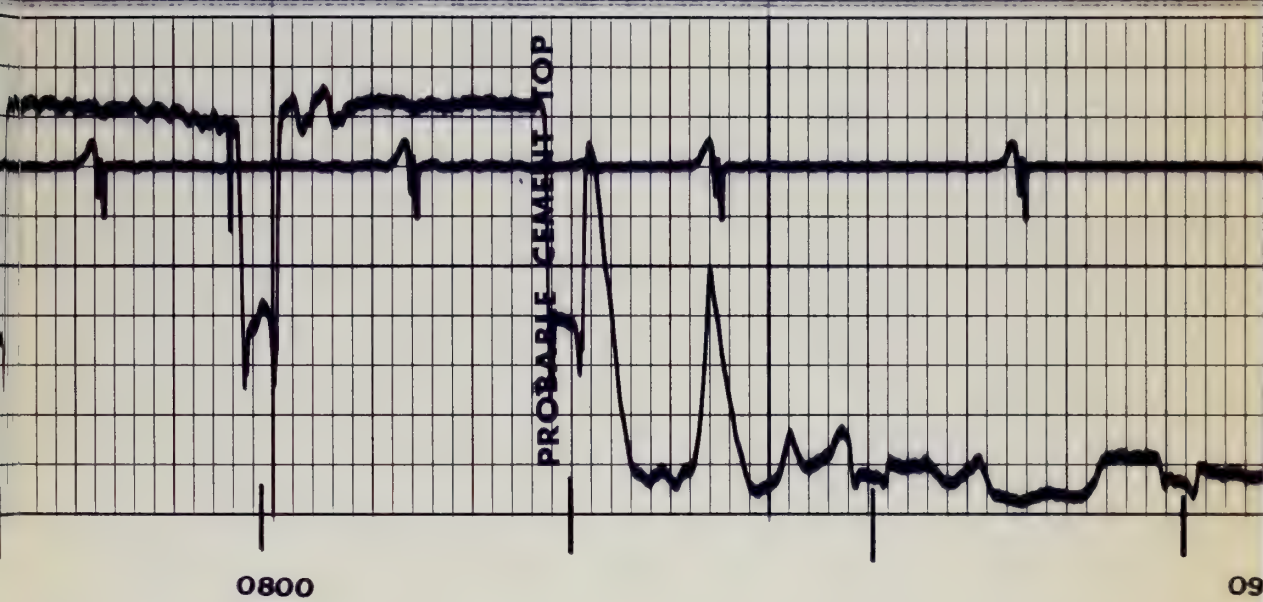
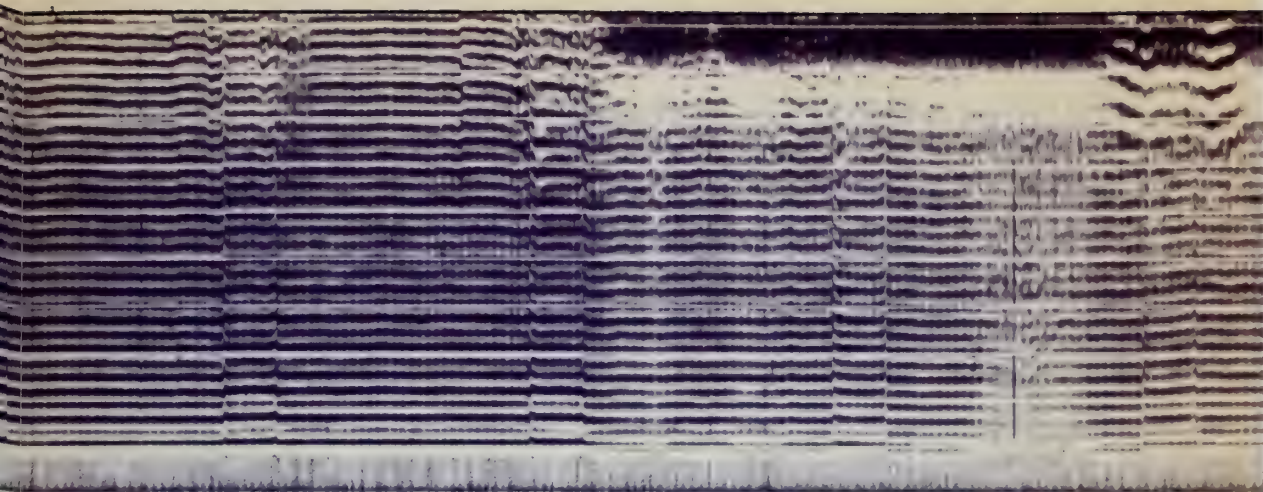
Correct Depth

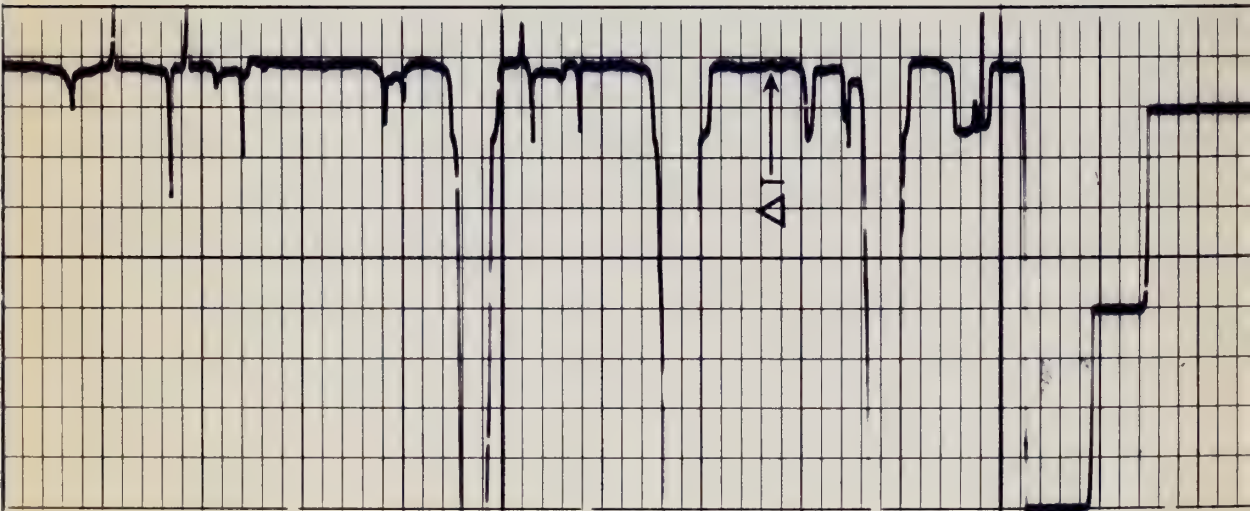
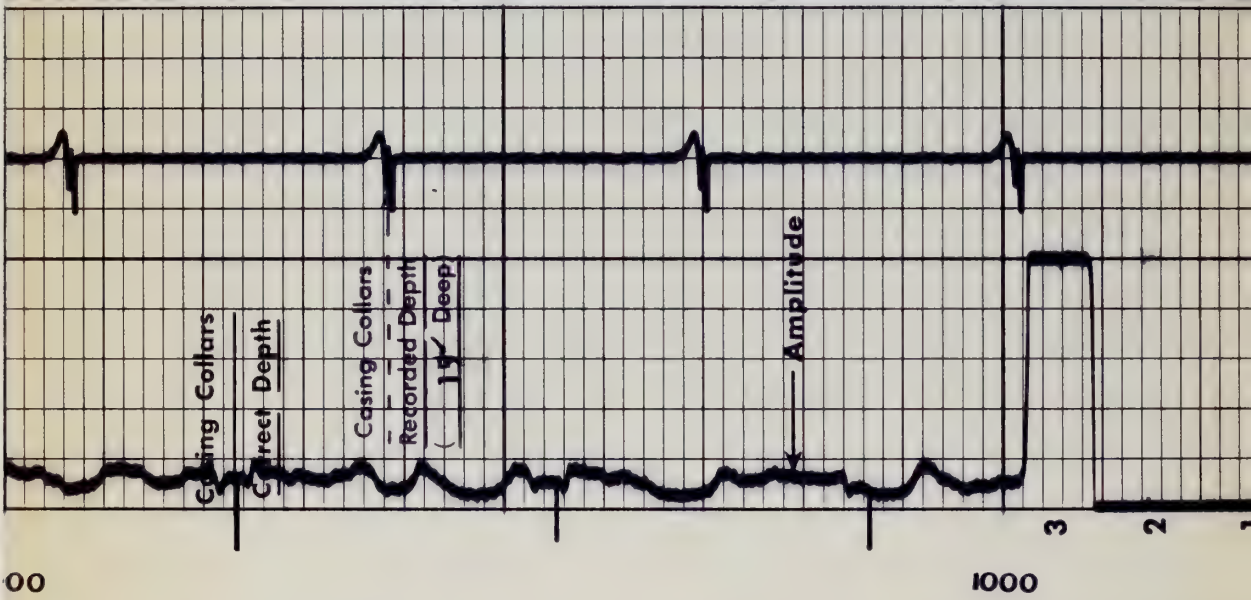
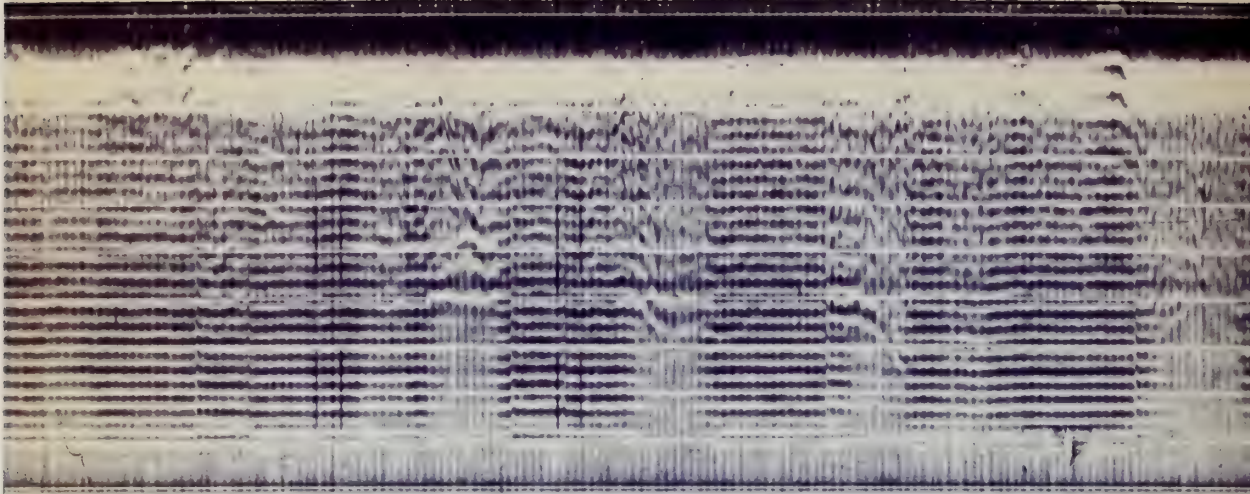
Casing Collars

Recorded Depth

(15' Deep)







Casing Collars Corrected Depth		Casing Bond MILLIVOLTS		Variable Density MICROSECONDS		SPACING	
0		100		200		1200	
DEPTH							
COMPANY ATLANTIC RICHEFIELD COMPANY				SCHL. FR 2712			
WELL S.G. NO. 9				SCHL. TD 2720			
FIELD SORGHUM GULCH				DRLR TD ---			
COUNTY RIO BLANCO				Elev: KB ---			
STATE COLORADO				DF ---			
				GL 6870			

CEMENT BOND CALIBRATION CODING

	Δt	AMPLITUDE
1. MECHANICAL ZERO		MECHANICAL ZERO
2. 240 μ sec		ELECTRICAL ZERO
3. 320 μ sec		CALIBRATE
4. 400 μ sec		

Schlumberger

ORIENTED PERFORATING RECORD AND CASING COLLAR LOG

COUNTY RED BLAQUE
FIELD or LOCATION S.G. NO. 9
WELL S.G. NO. 9
COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL S.G. NO. 9

FIELD _____

COUNTY RED BLAQUE STATE COLORADO

Location:
Sec. 11 Twp. 30 Rge. 27W

Other Services:
CEILING VILL.
1 AND 2

Permanent Datum: GROUND LEVEL; Elev.: 6370
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. _____
D.F. _____
G.I. 6370

Date	10/31, 11/4/74
Run No.	ONE
Pipe String No.	1 AND 2
Pipe String Ident.	LONG & SHORT
Type Orienting	POWERED
Type fluid in hole	WATER
Salinity, PPM Cl.	-----
Density	-----
Level	FULL
Max rec. temp., deg F.	-----
Operating rig time	-----
Recorded by	ST. AUGUSTINE
Witnessed by	MR. TURTIS

BORE-HOLE RECORD

CEMENTING RECORD

Bit	From	To	Type	Wgt.	From	To
7 7/8	65	2750	Primary	HOWCO	310	2740
				LT. WT.		
			Squeeze	54 MILCONITE/SL		

The well name, location and borehole reference data were furnished by the customer.

FORM 1000

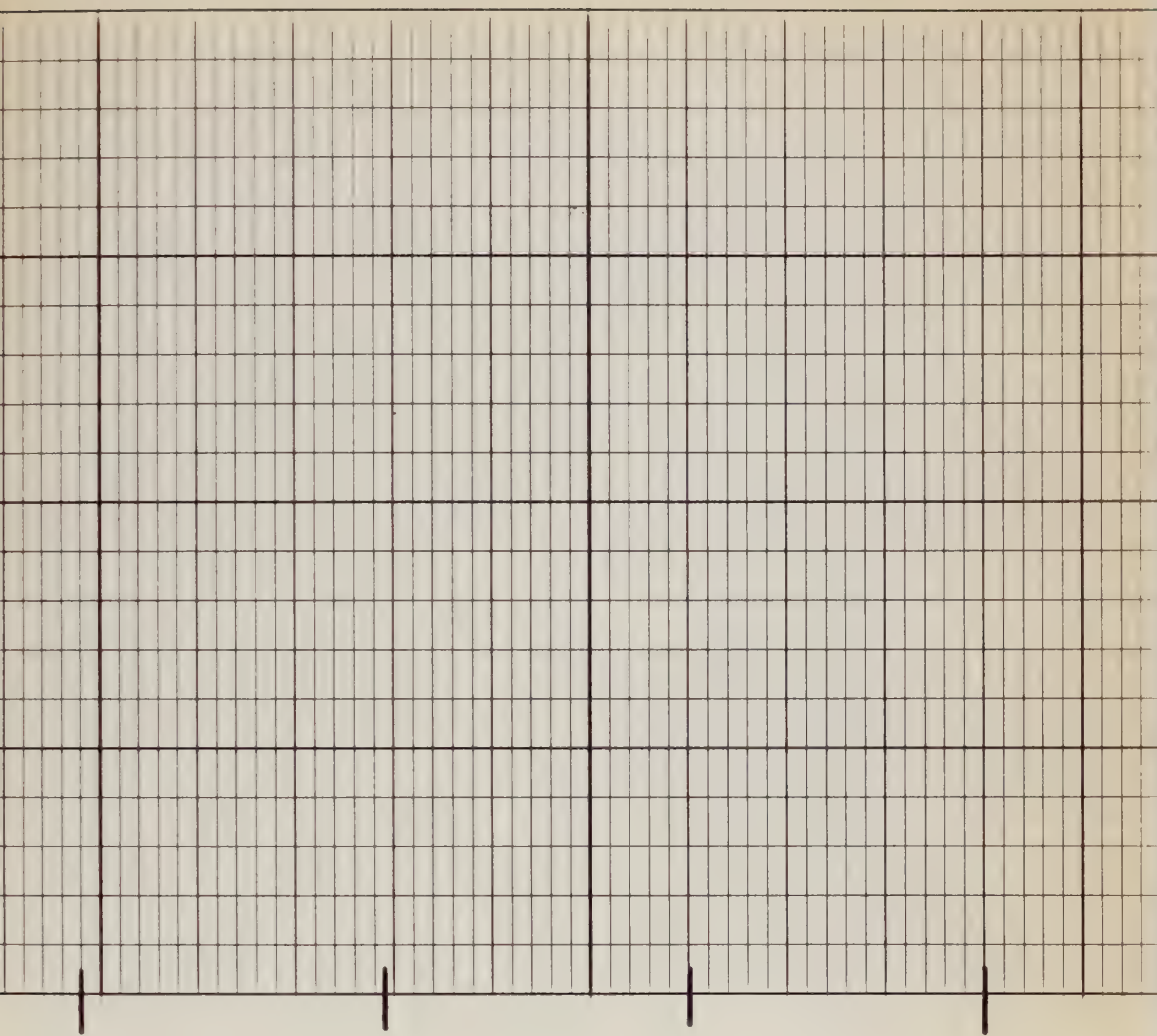
THIS FORM IS THE PROPERTY OF Schlumberger Limited and should be returned to the company.

EQUIPMENT DATA					DEPTHS RELATE TO		CASING COLLARS	
Hoist Truck No.	3002	Rotator Size	11/16"		Radioactivity Measurements	<input type="checkbox"/>		
Inst. Truck No.	3002	Rotator No.	511		Schlumberger Line Measurements	<input type="checkbox"/>		
Tool Serial No.	2324	Indexer Type	PCS-D					
Location	VERAL	Indexer No.	511					

PERFORATING DATA				LOGGING DATA				PIPE STRING RECORD						
Depths		No. Shots	Gun Size	Gun Type	Time Const.	Sens. Setting	Zero Shift	Calib. Sens.	Calib. Defl.	Number	1	2	3	4
From	To									Identification	LOG	SHORT		
1310	1340	30	11/16	H-E	6	300	1	NO. 1	STRING	Size	2 3/3	2 3/3		
1370	2324	253	11/16	H-E	NON-ORIENTED	NO. 1	STRING			Weight	4.7	4.7		
337	1210	245	11/16	H-E	6	300	1	NO. 2	STRING	Depth	2740	153		

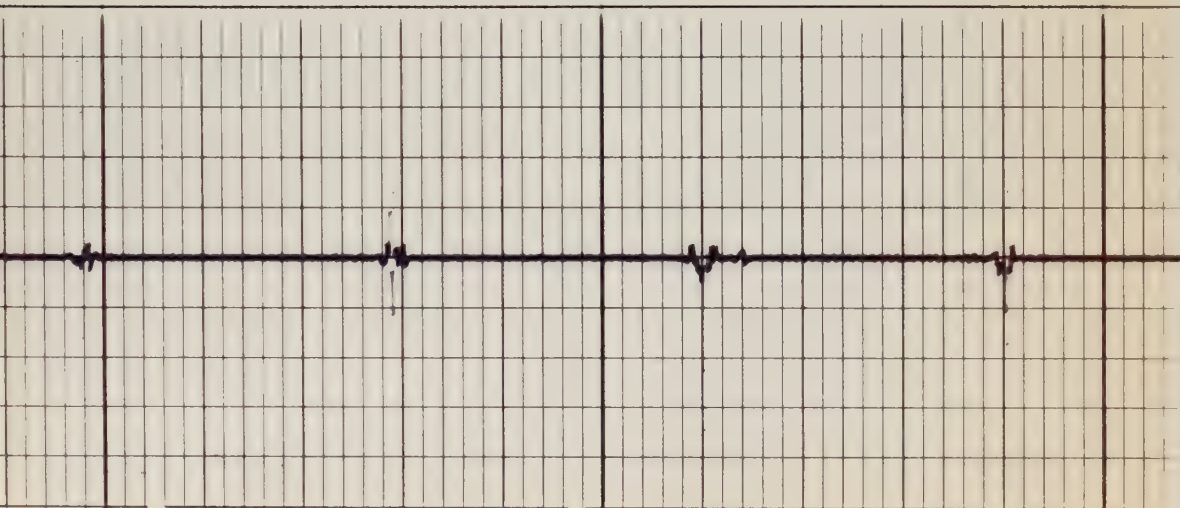
Remarks:

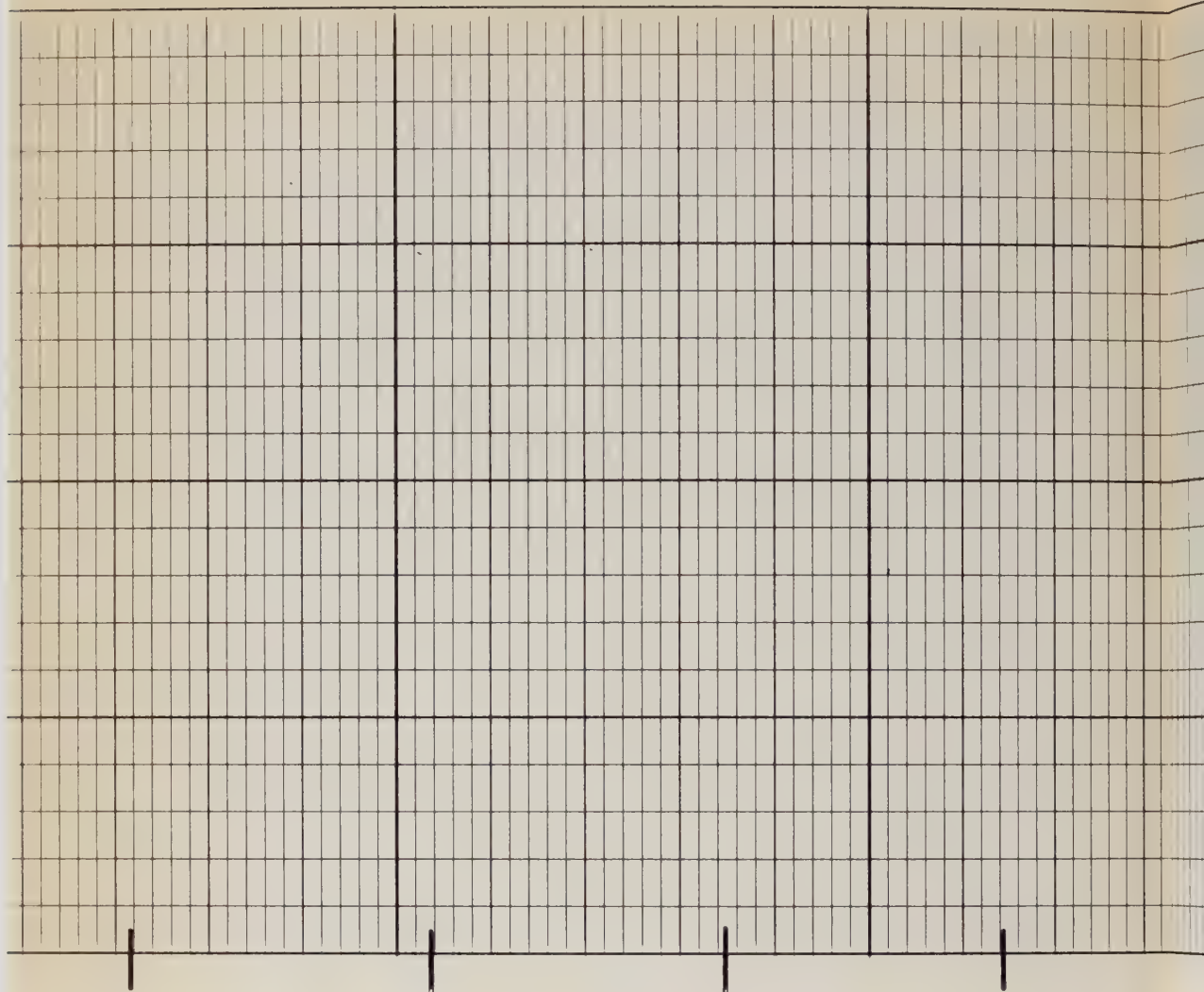
CASING COLLAR LOG BEFORE PERFORATION		DEPTHS	
NO. 1 LONG STRING			



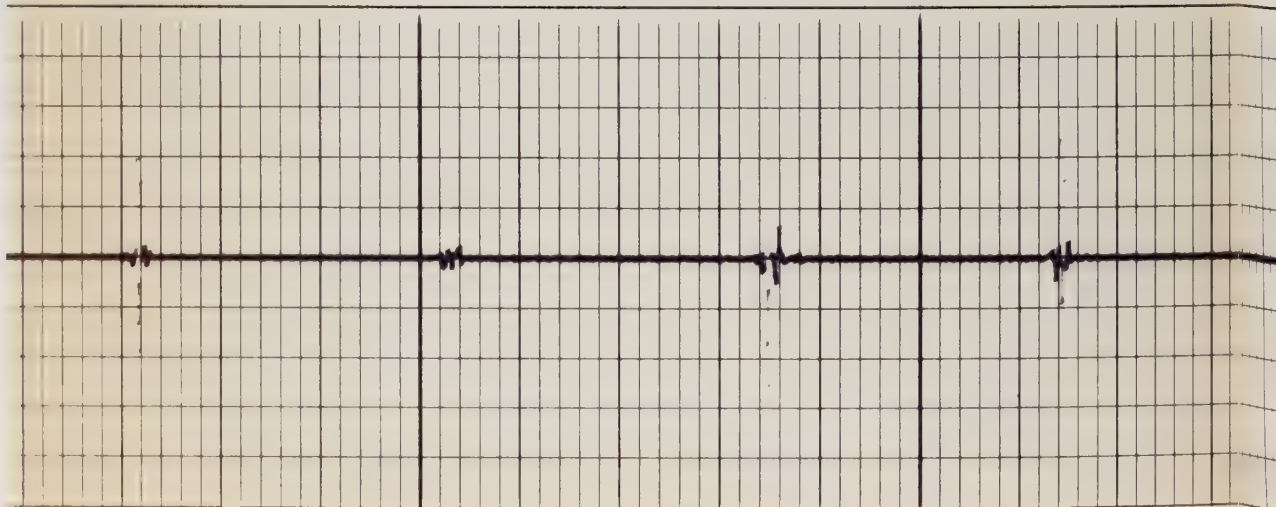
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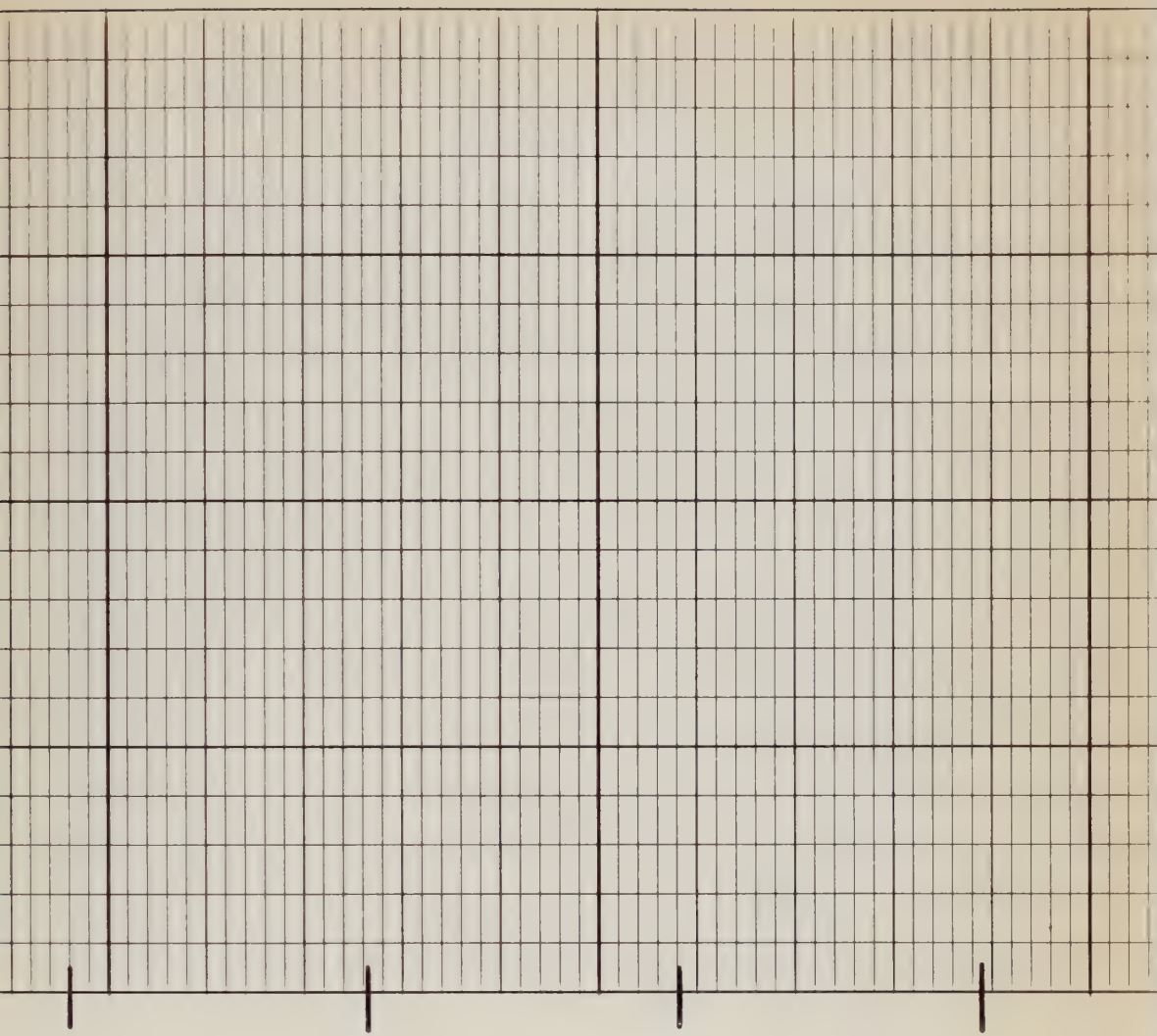
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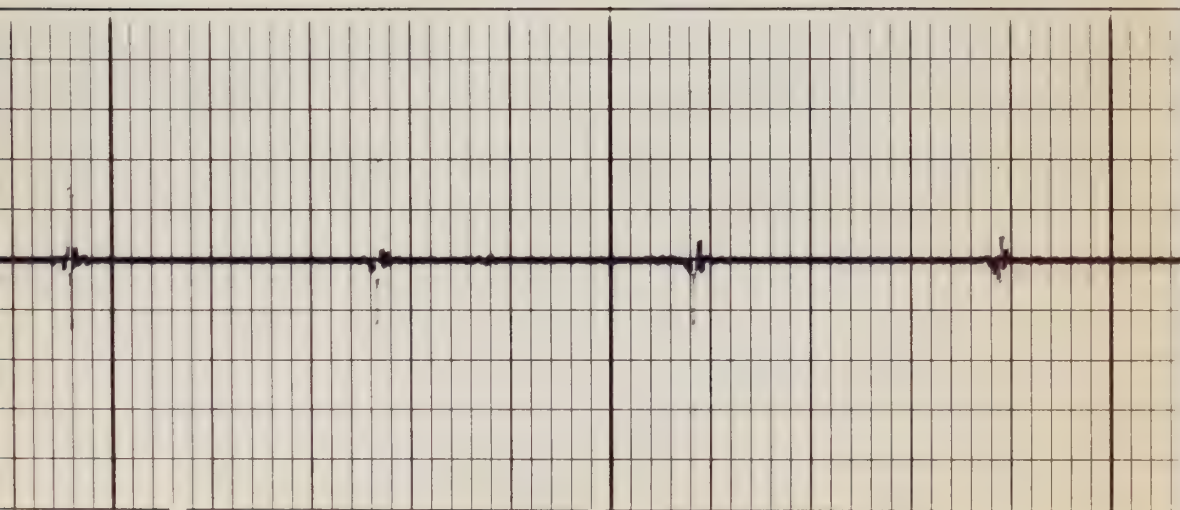


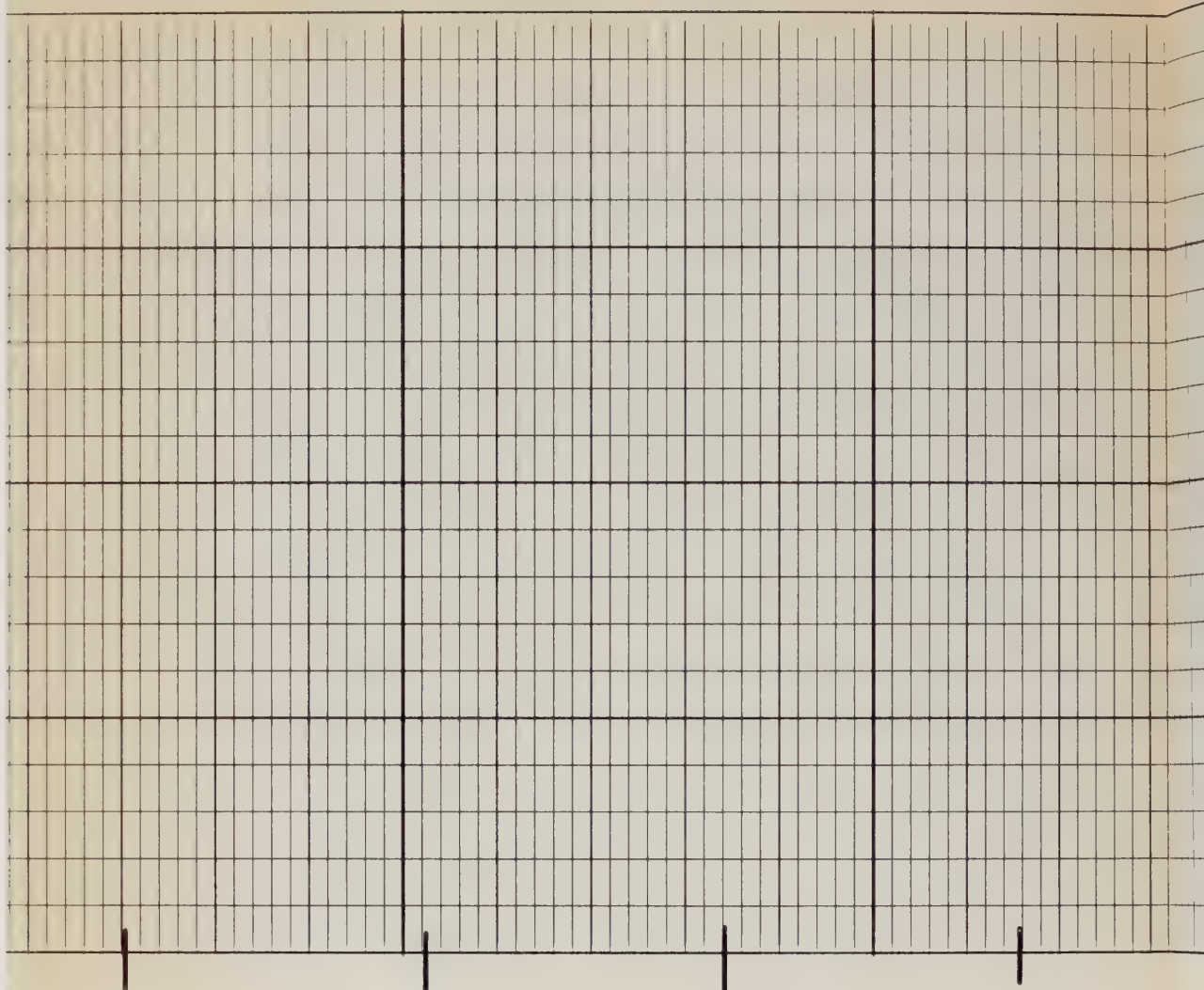
1100



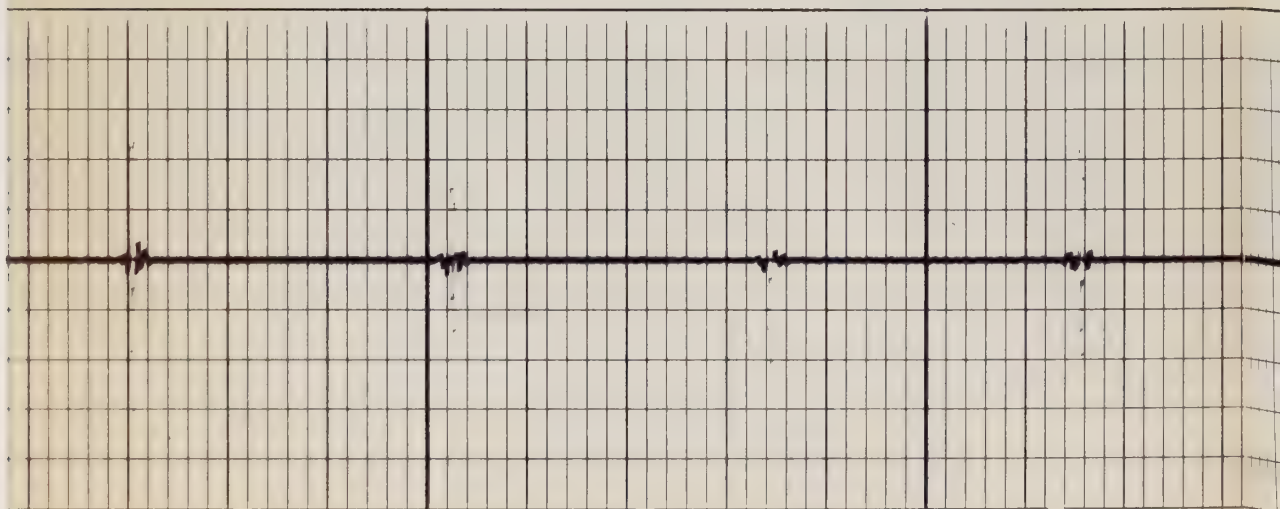


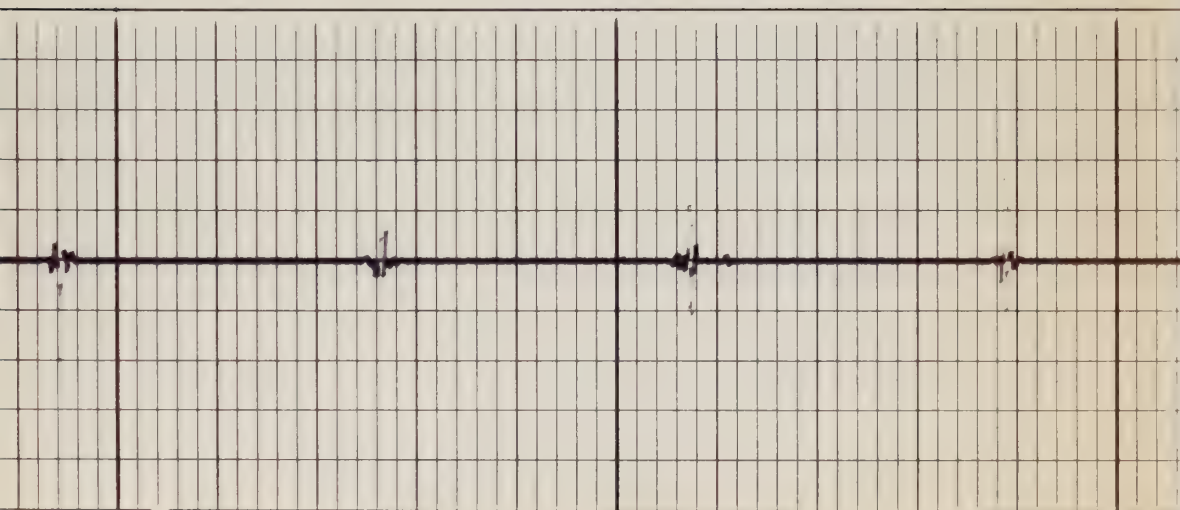
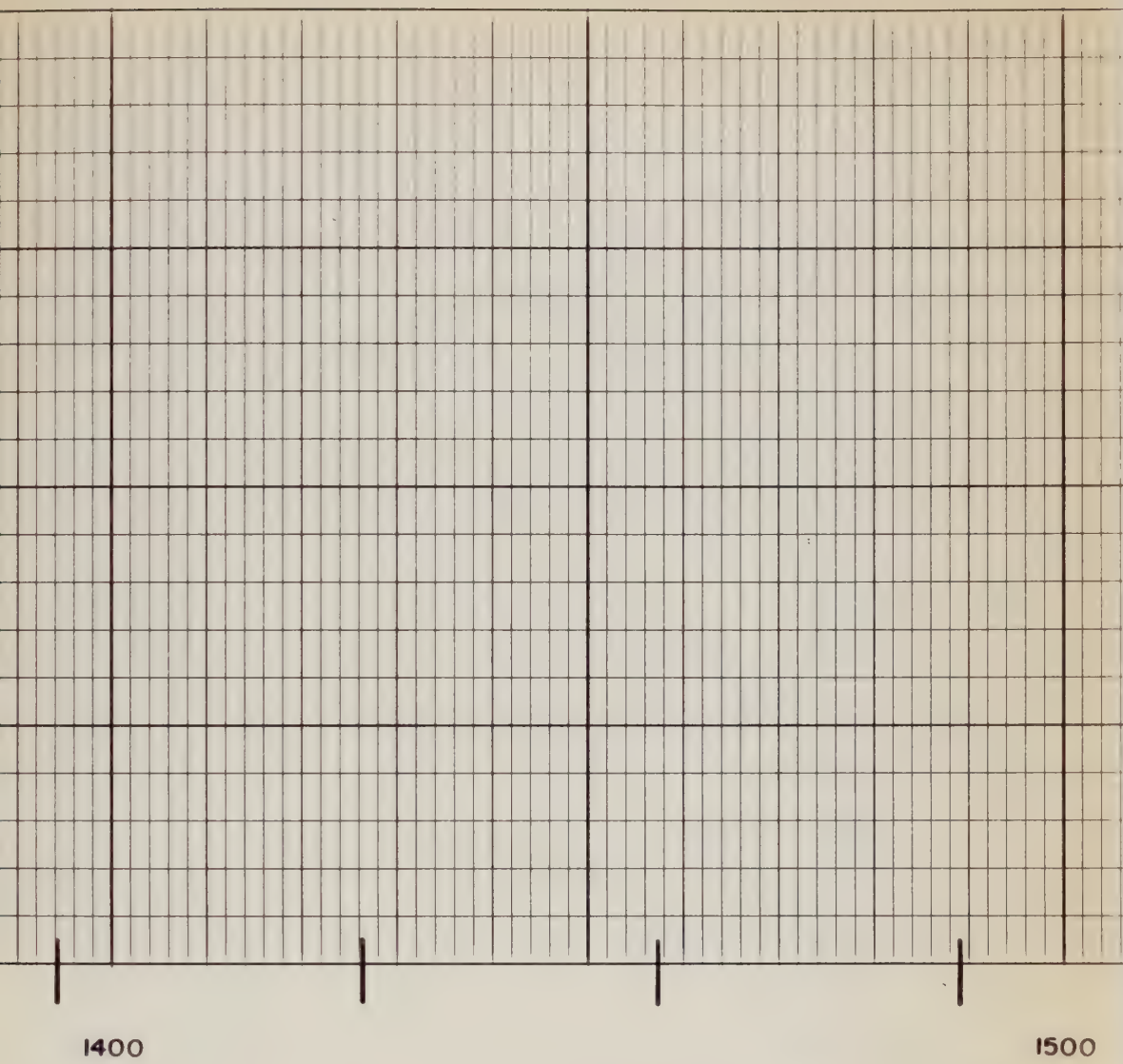
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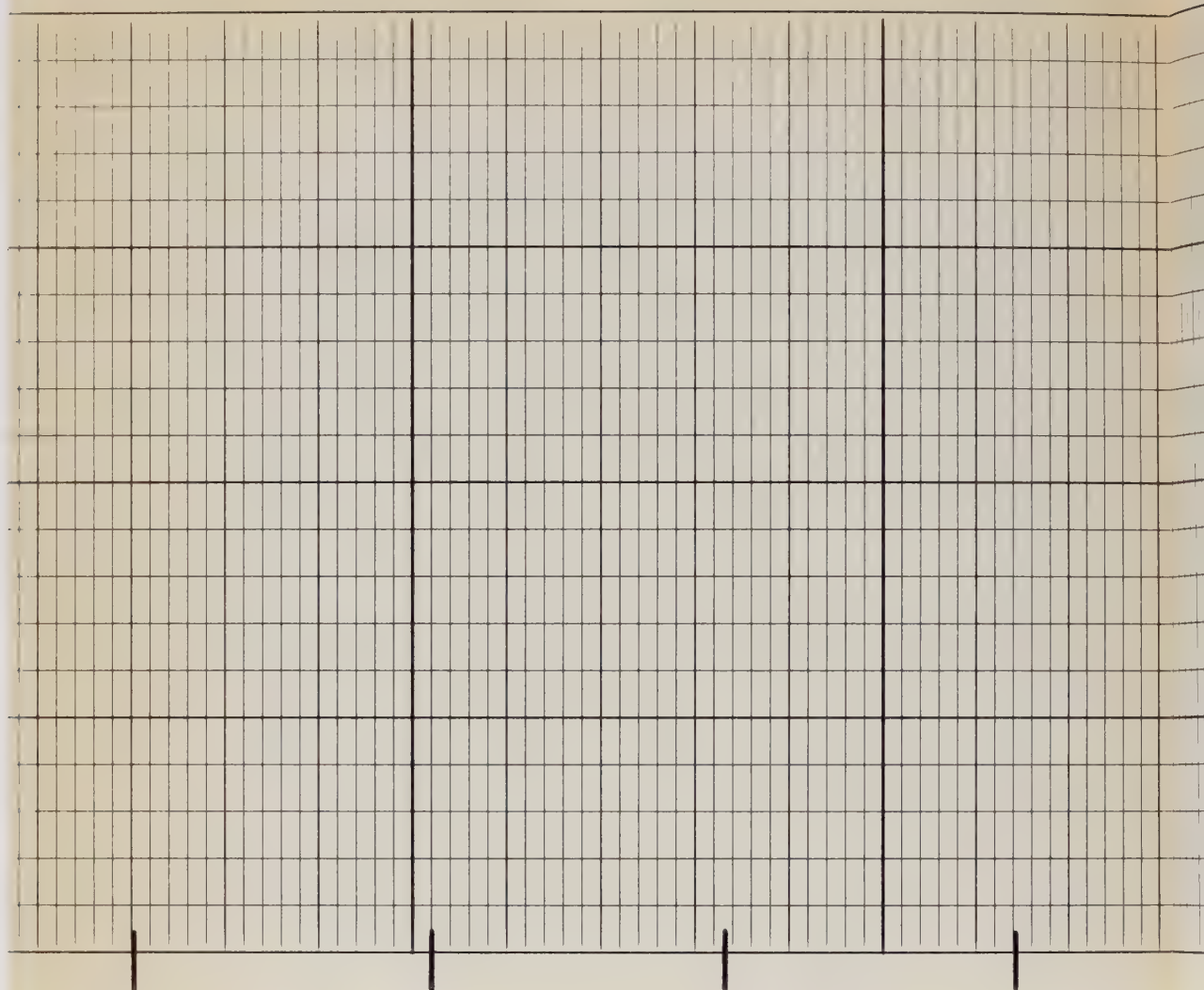




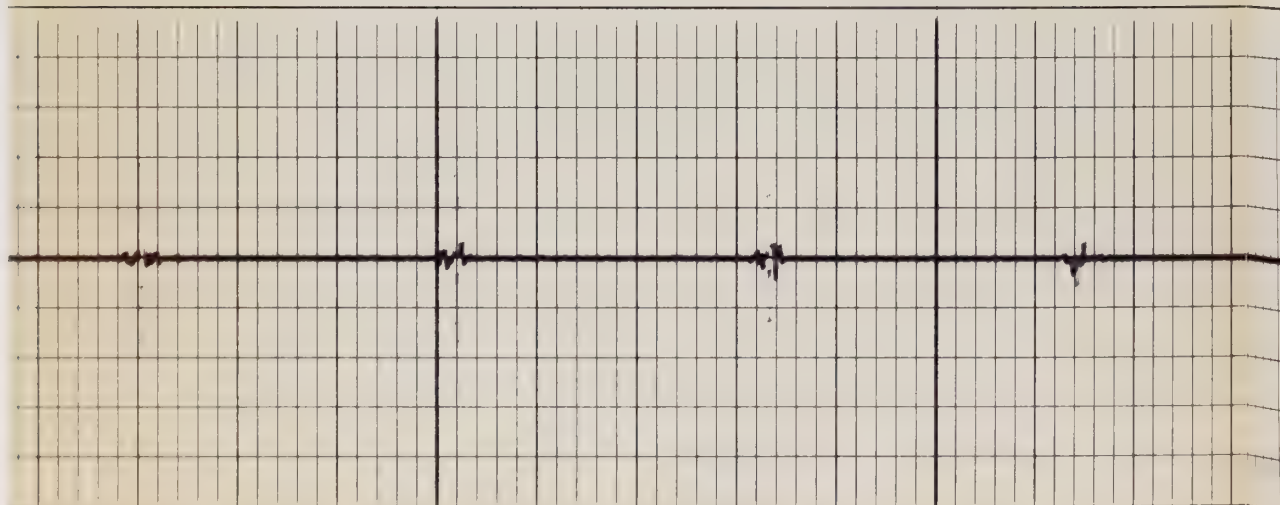
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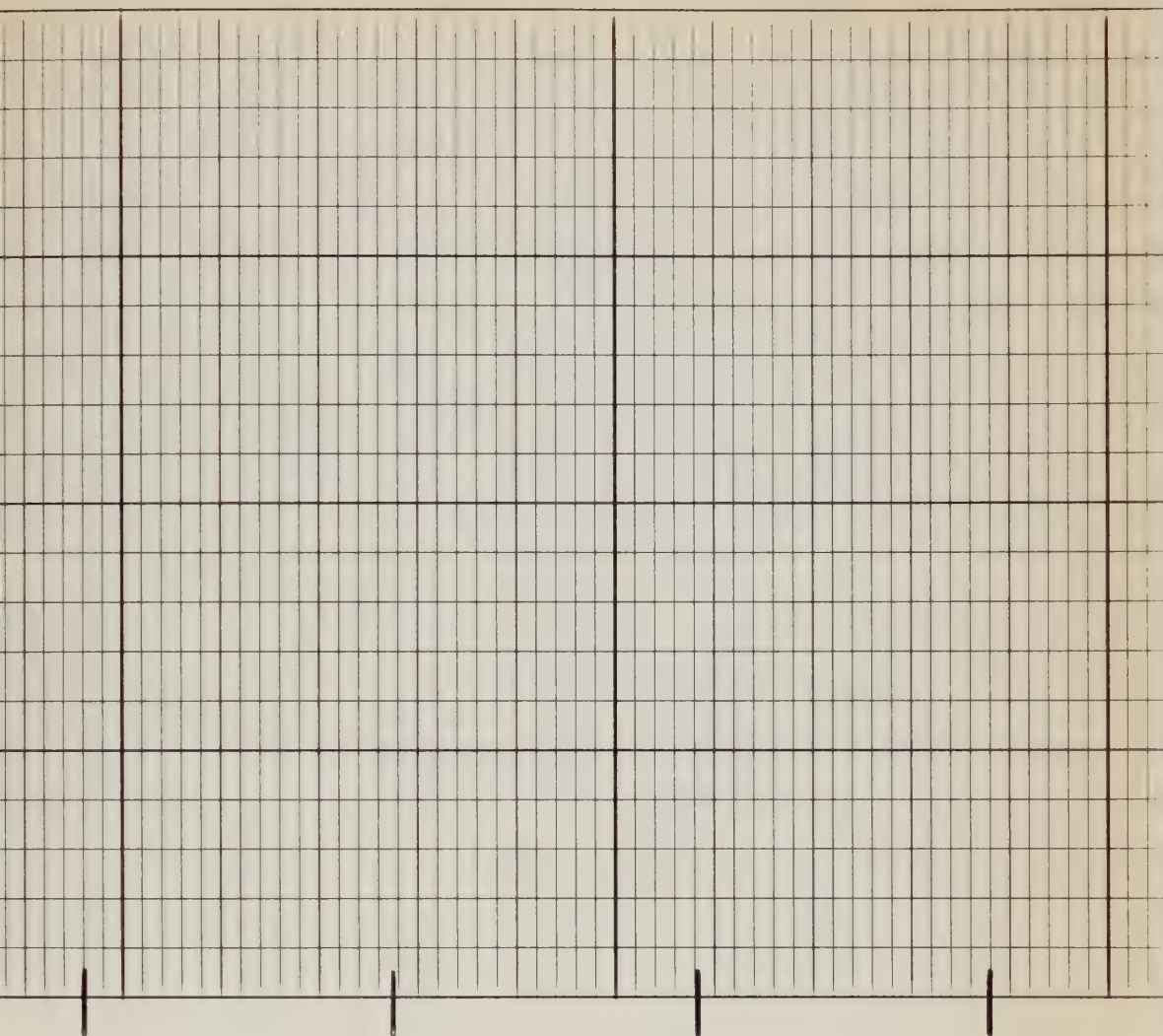




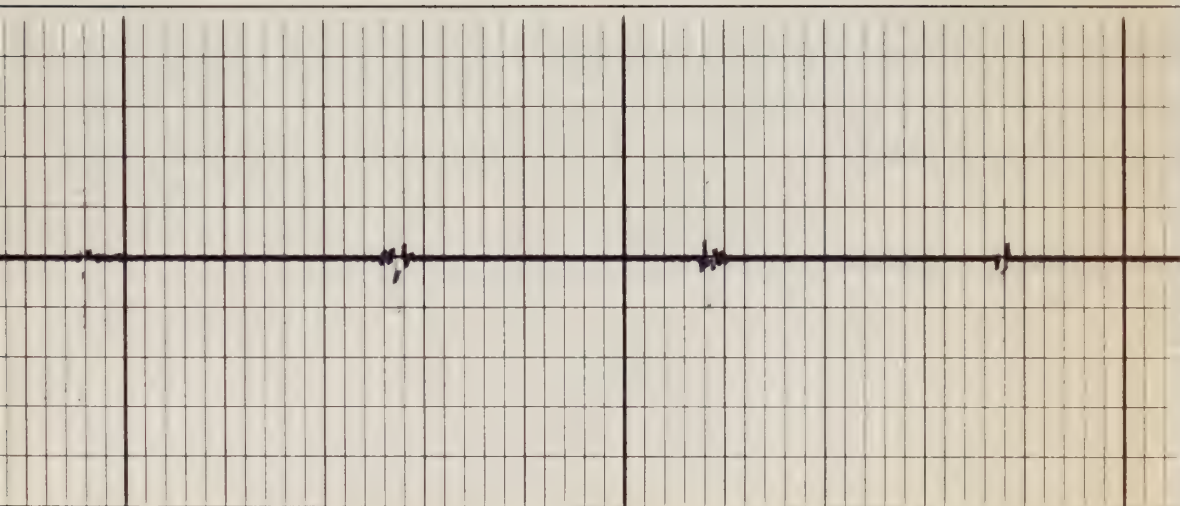


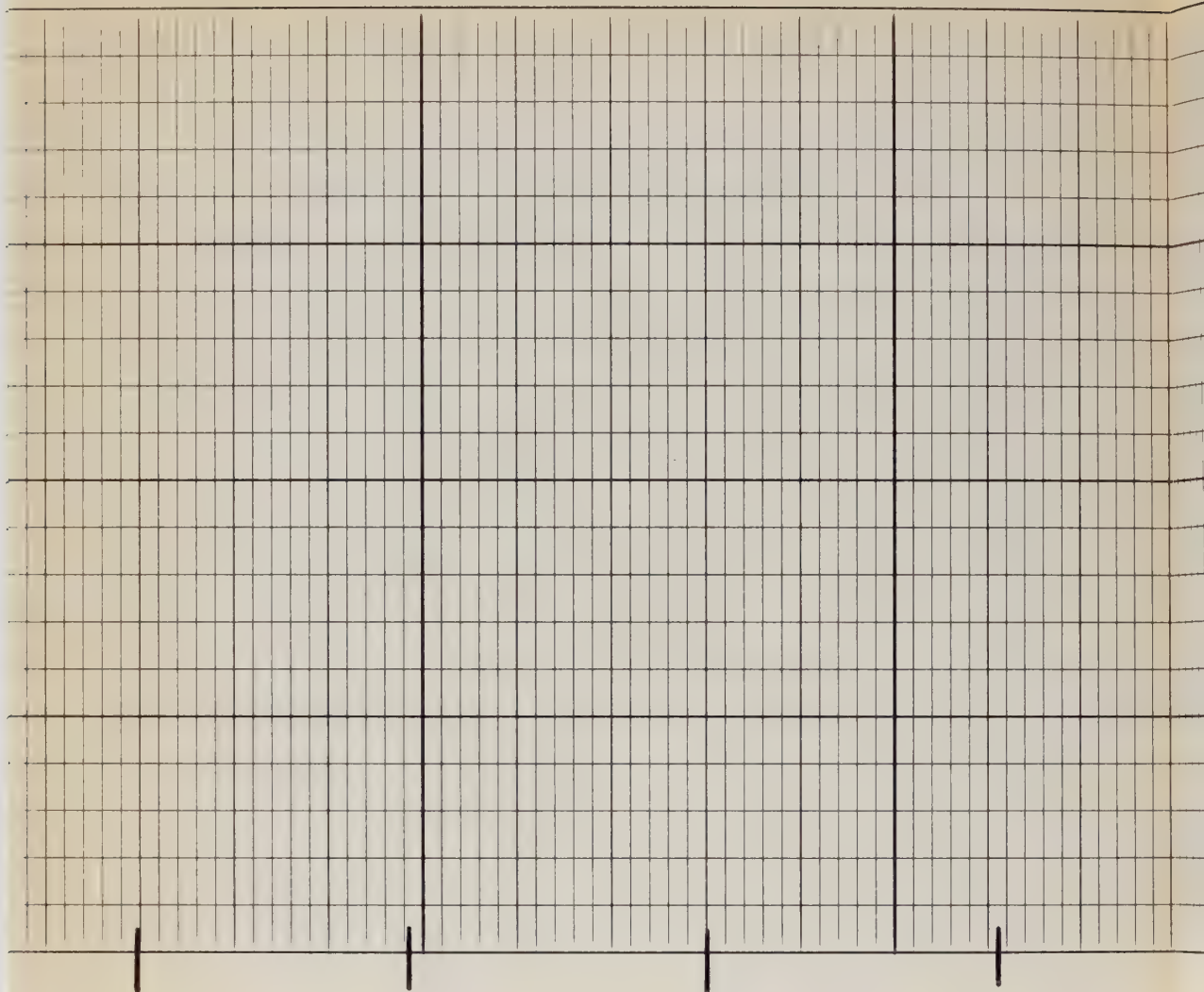
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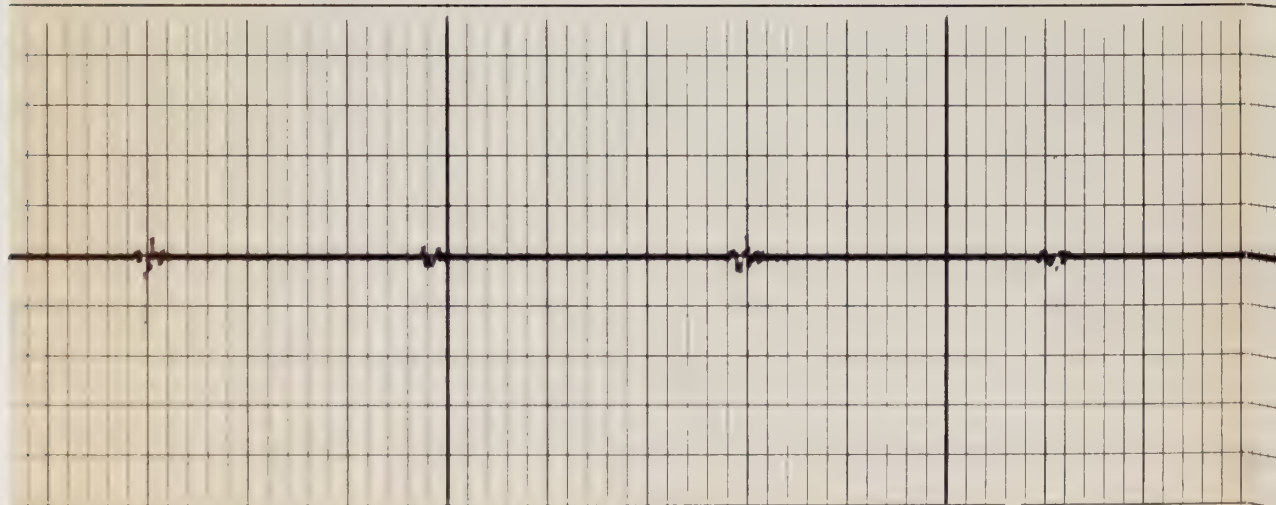


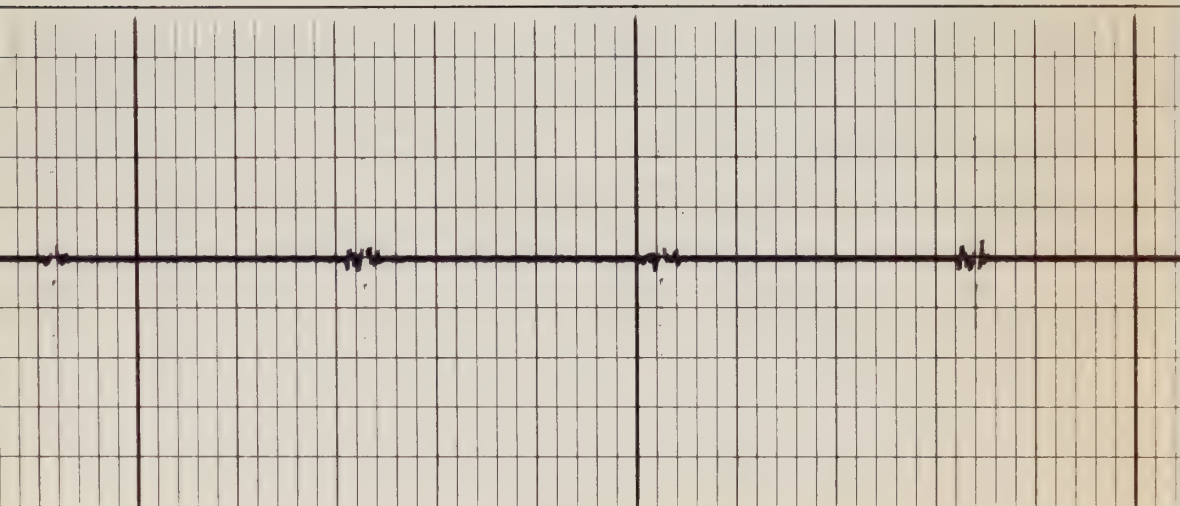
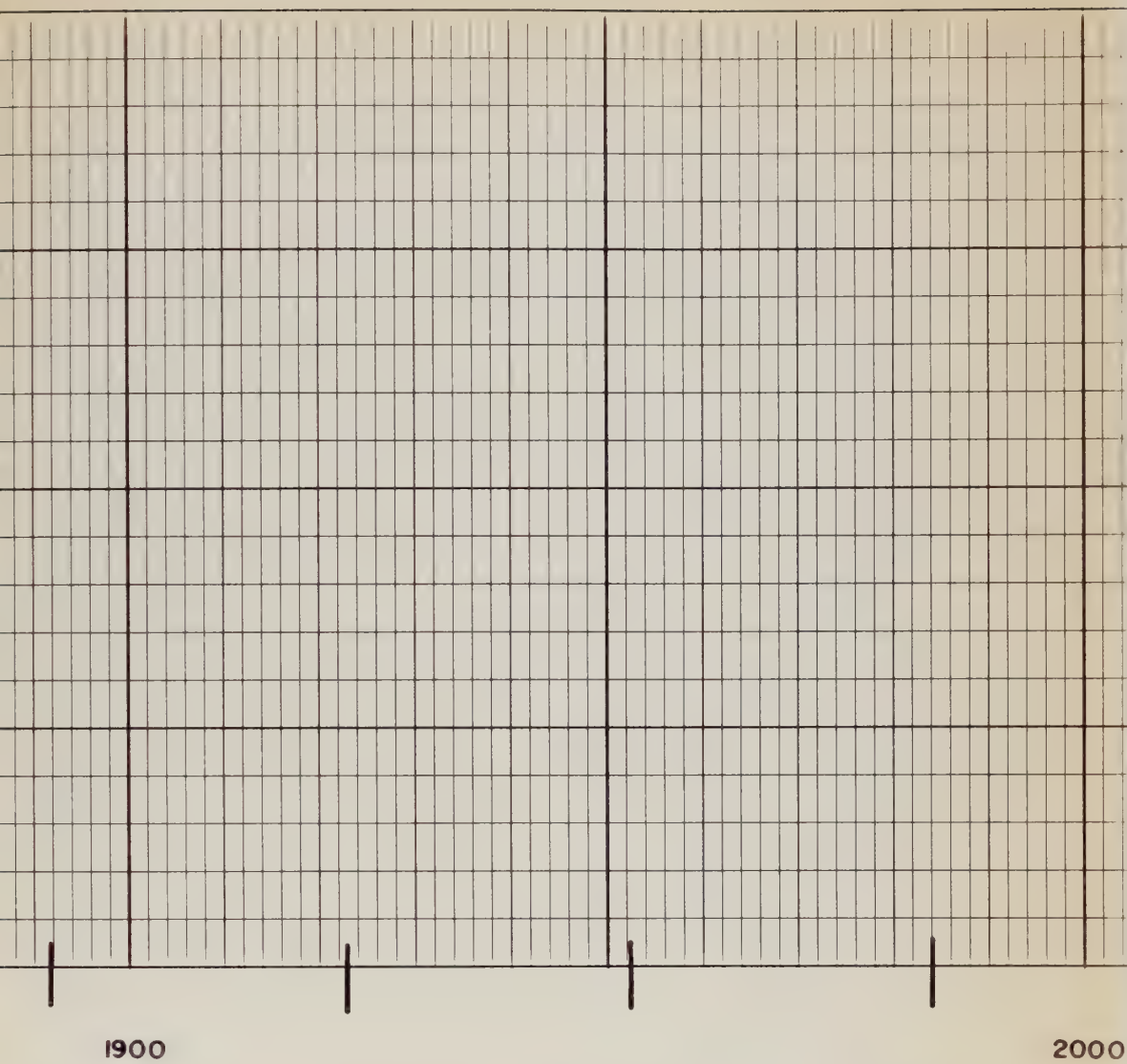
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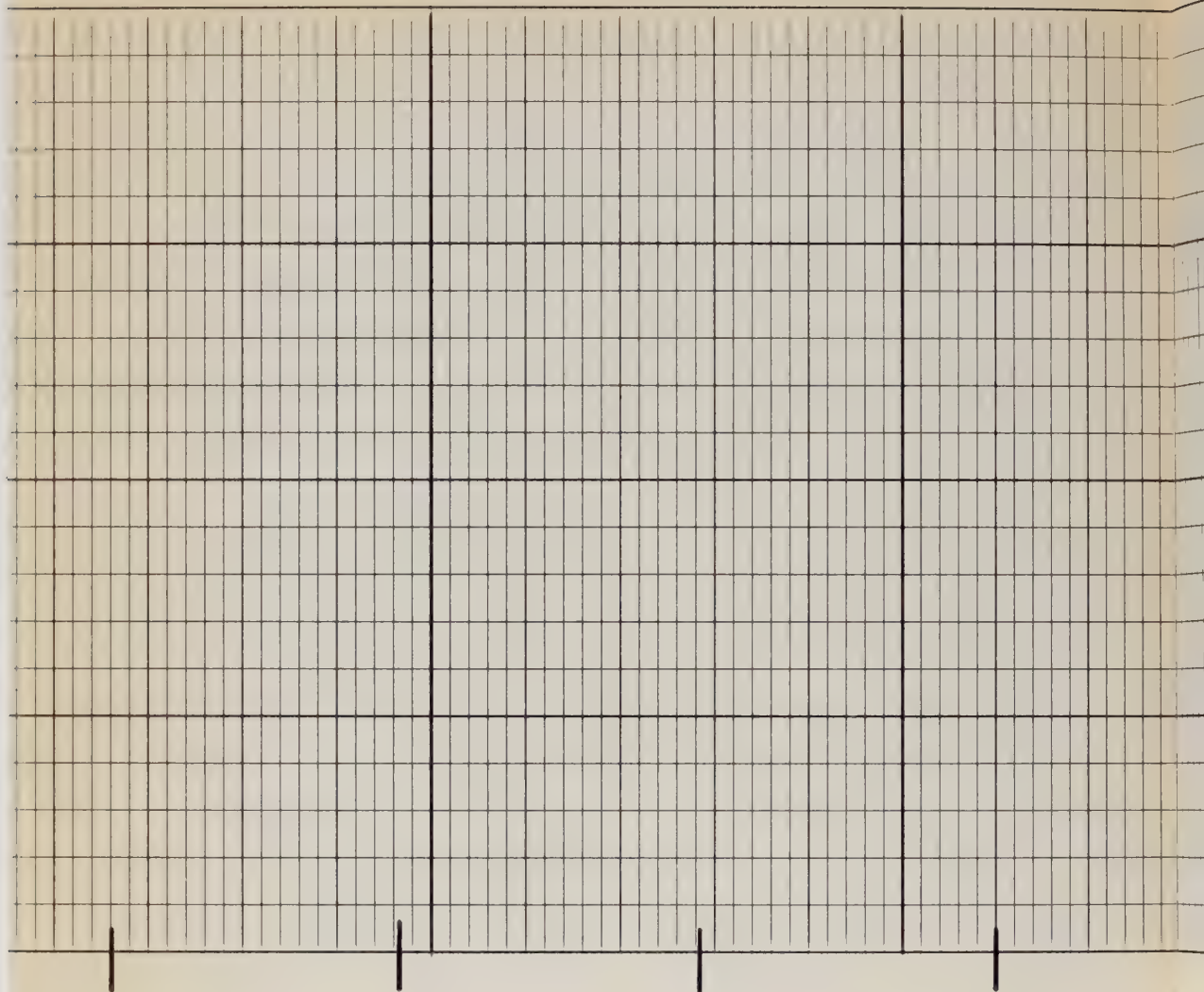




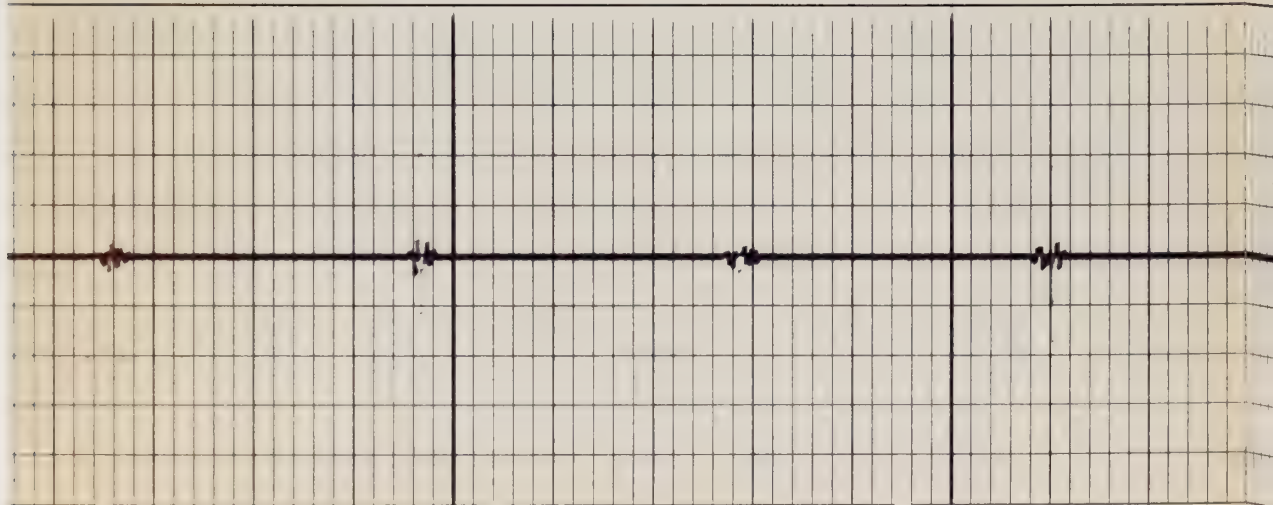
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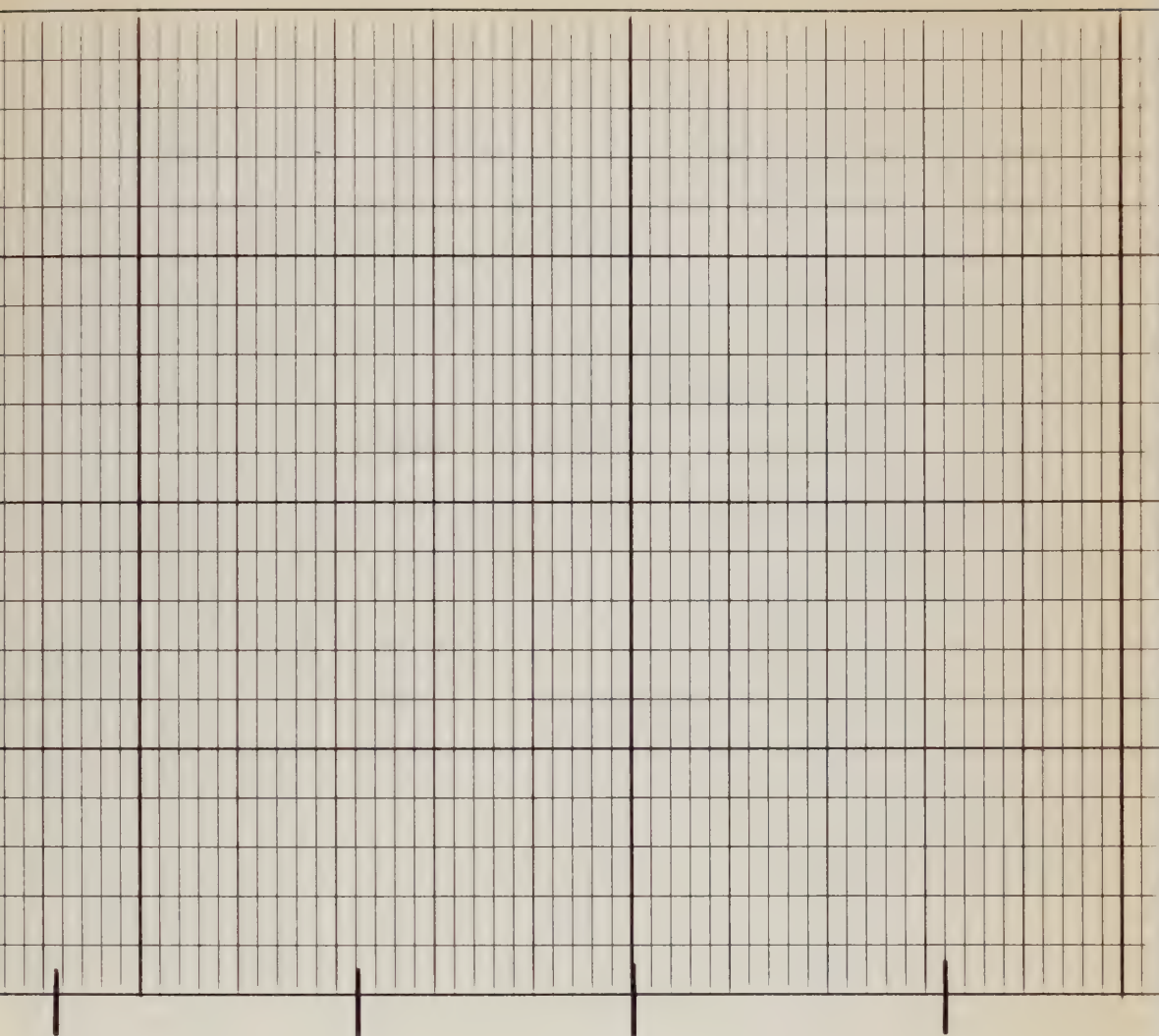




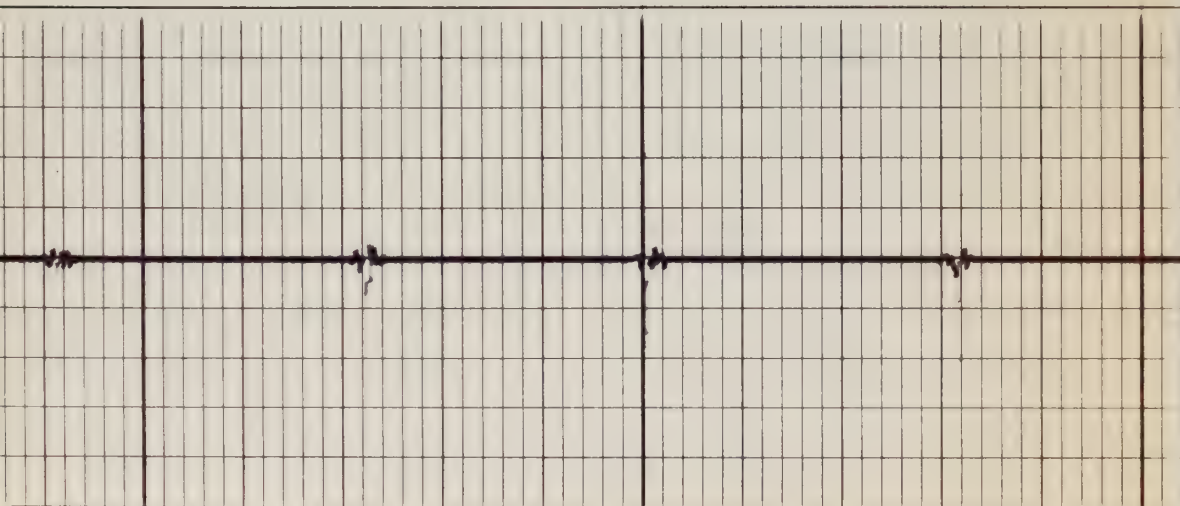


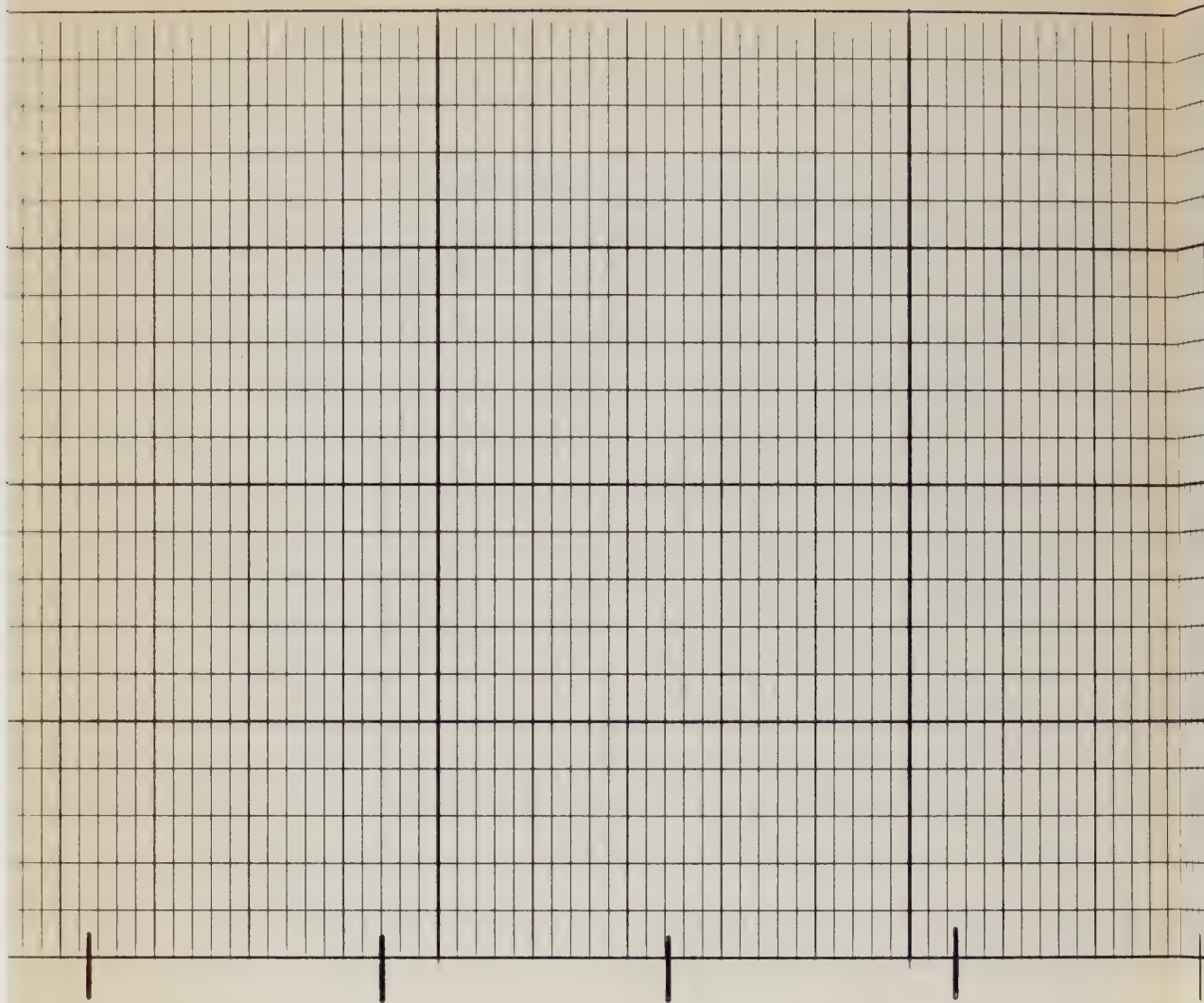
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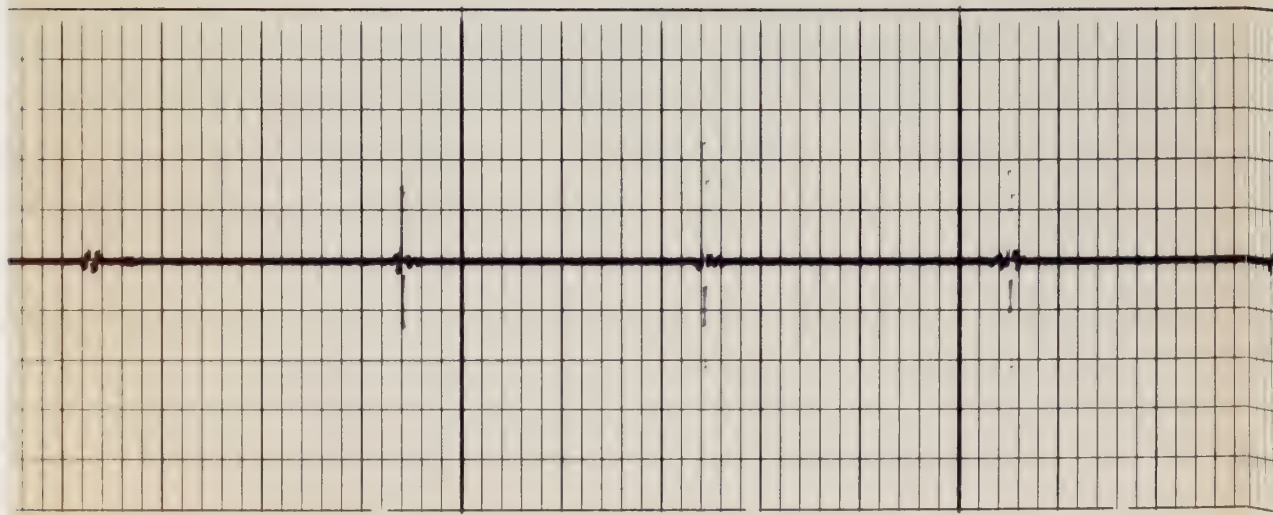


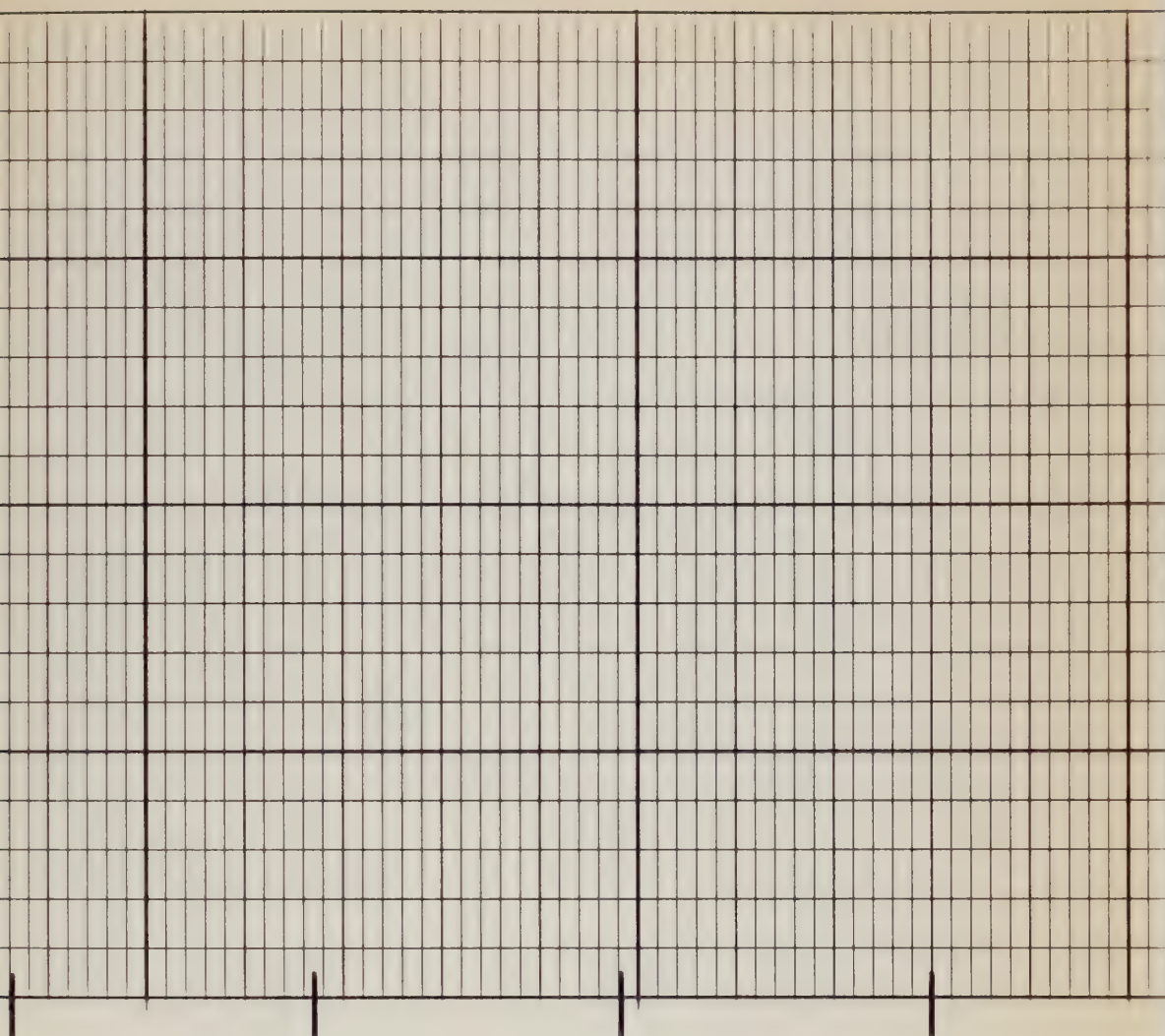
2200





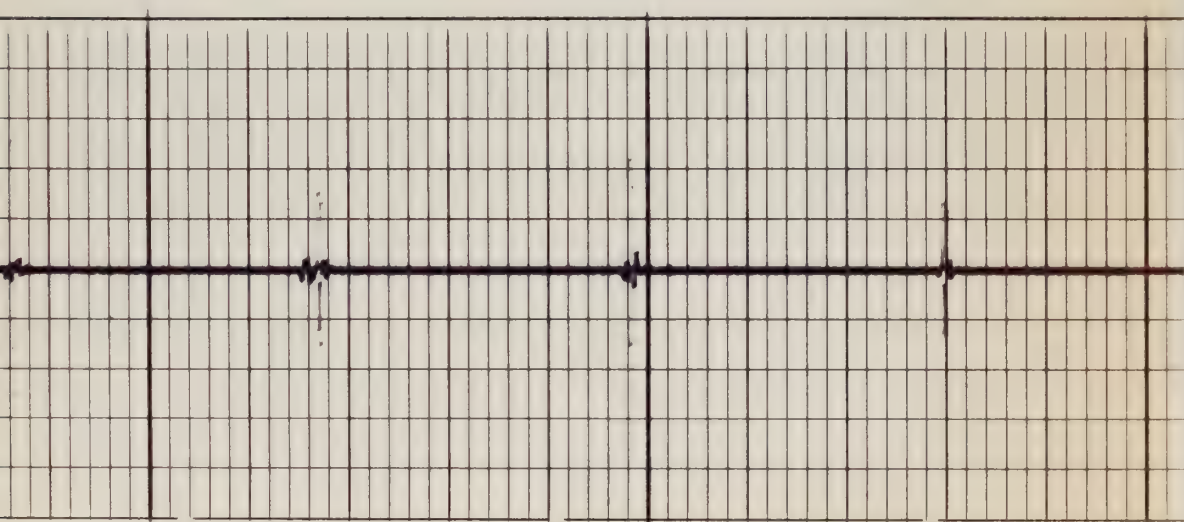
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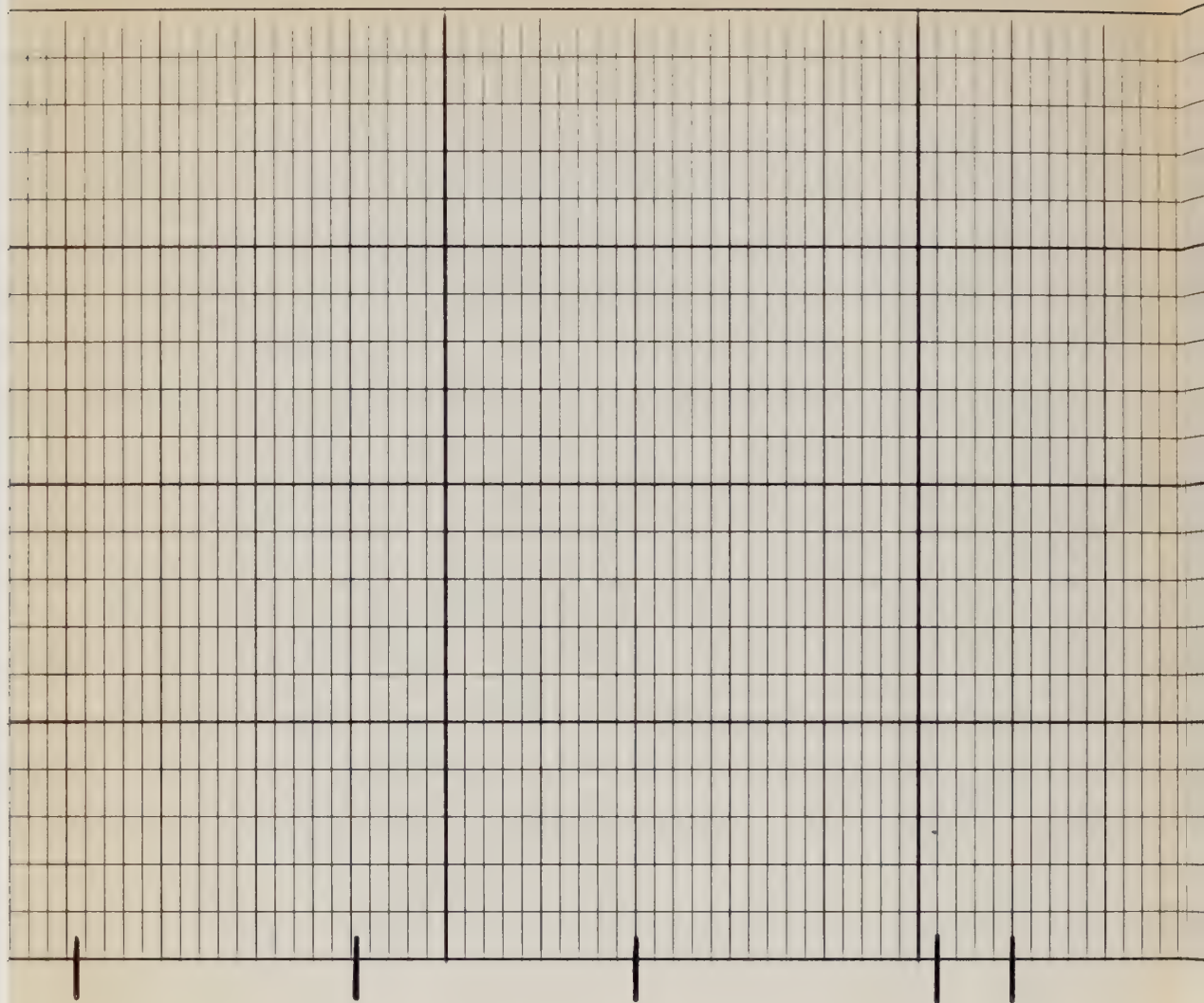




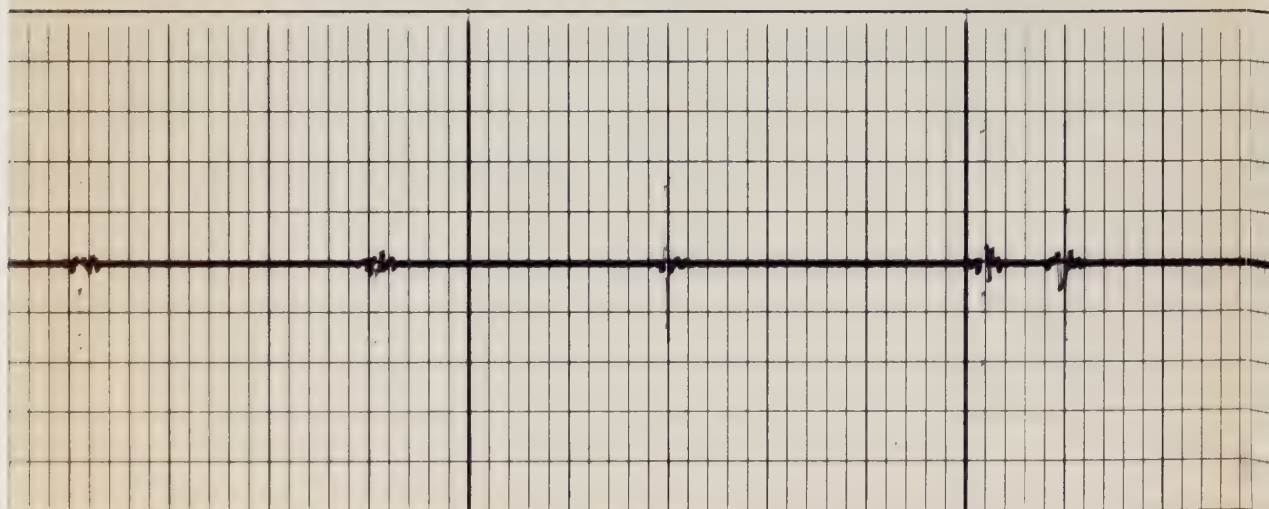
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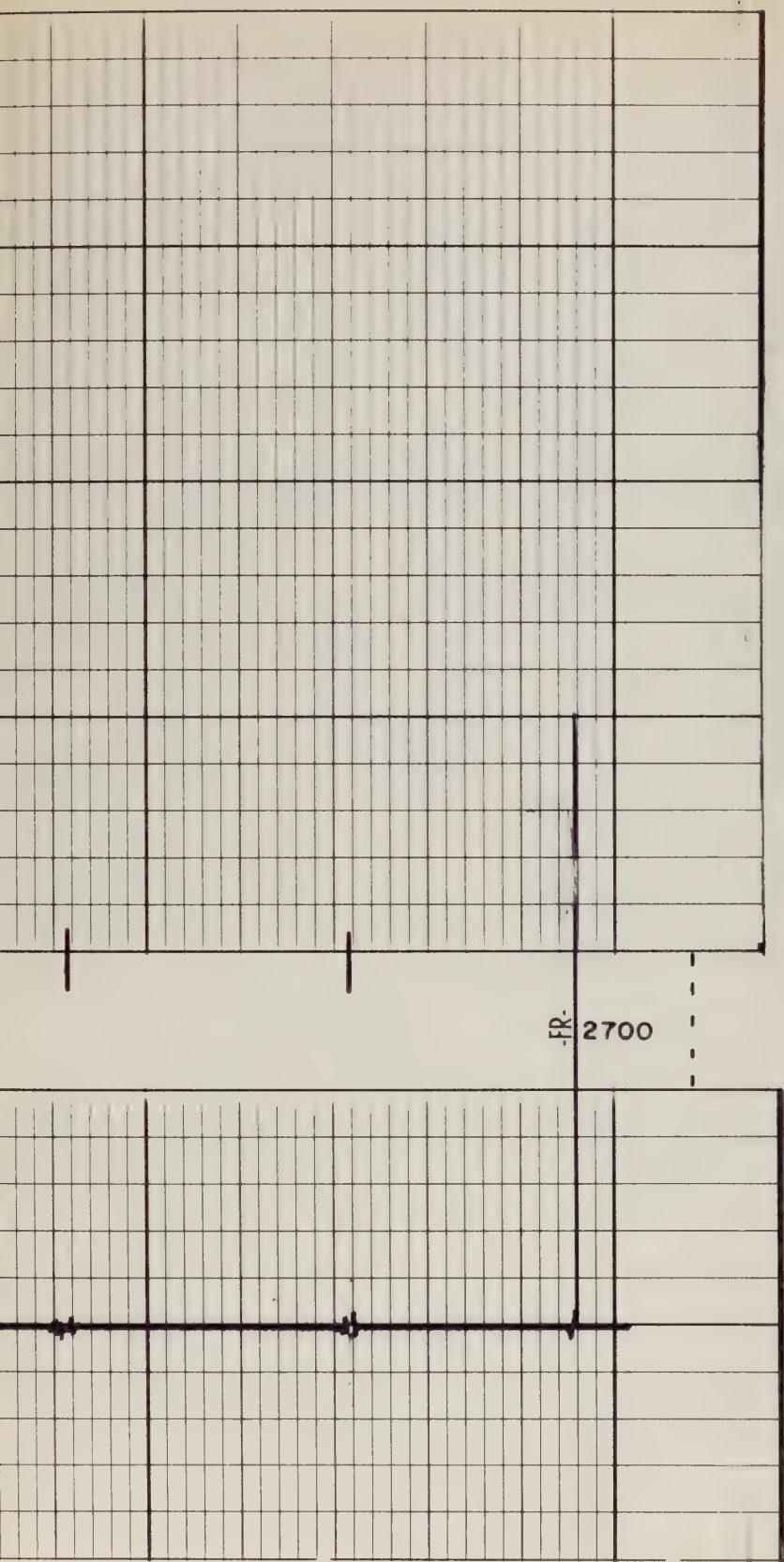
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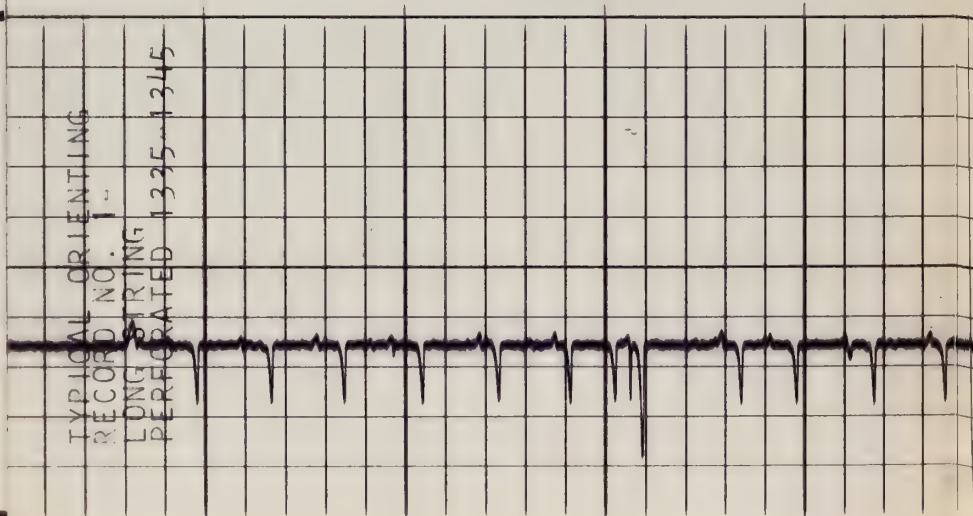
2600





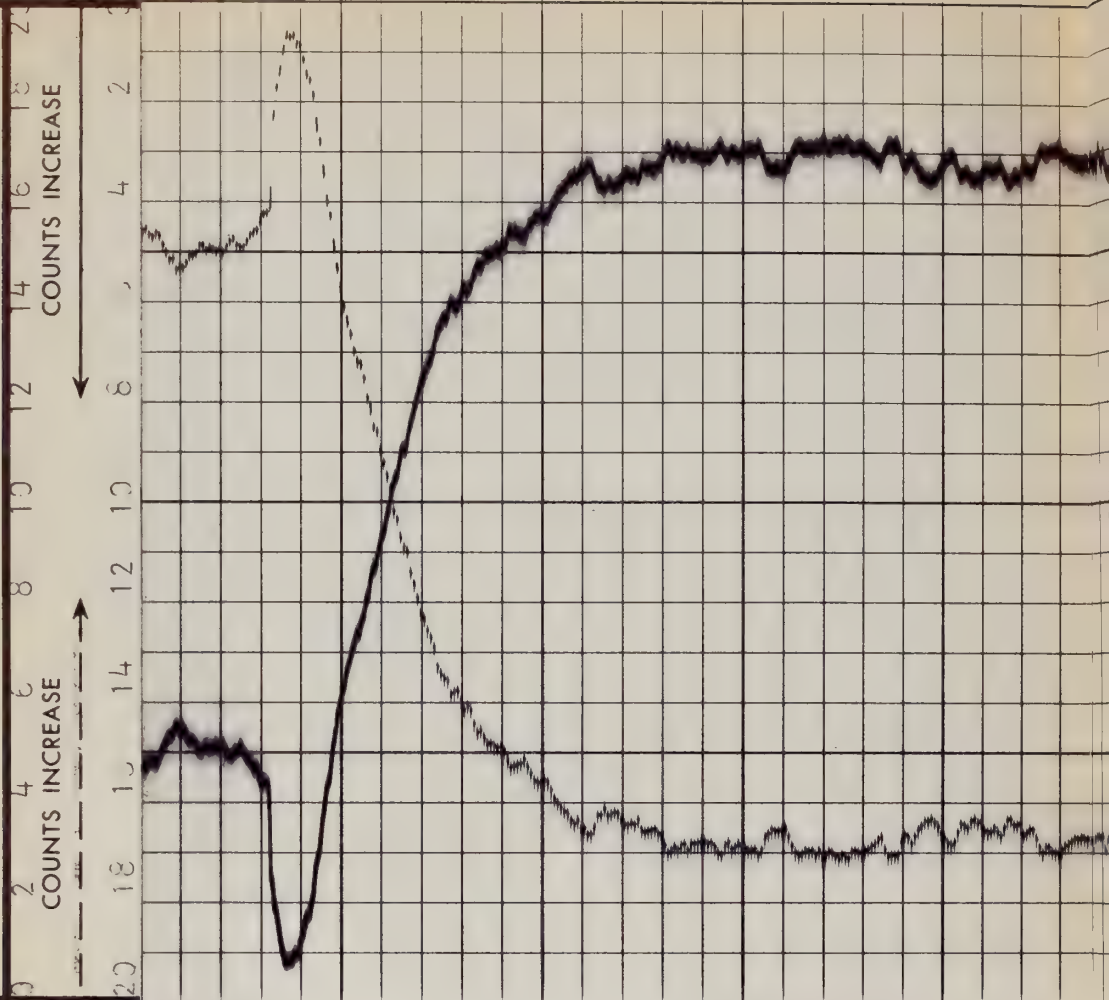
NO. 1 LONG STRING RADIORIENTATION RECORD
GUN #1 PERFORATED 1335-1345

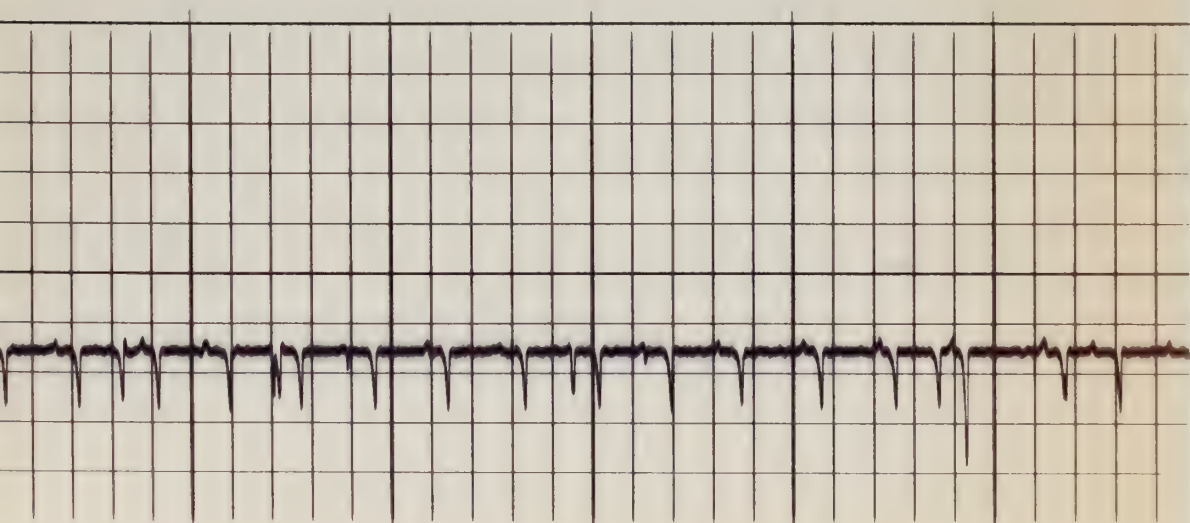
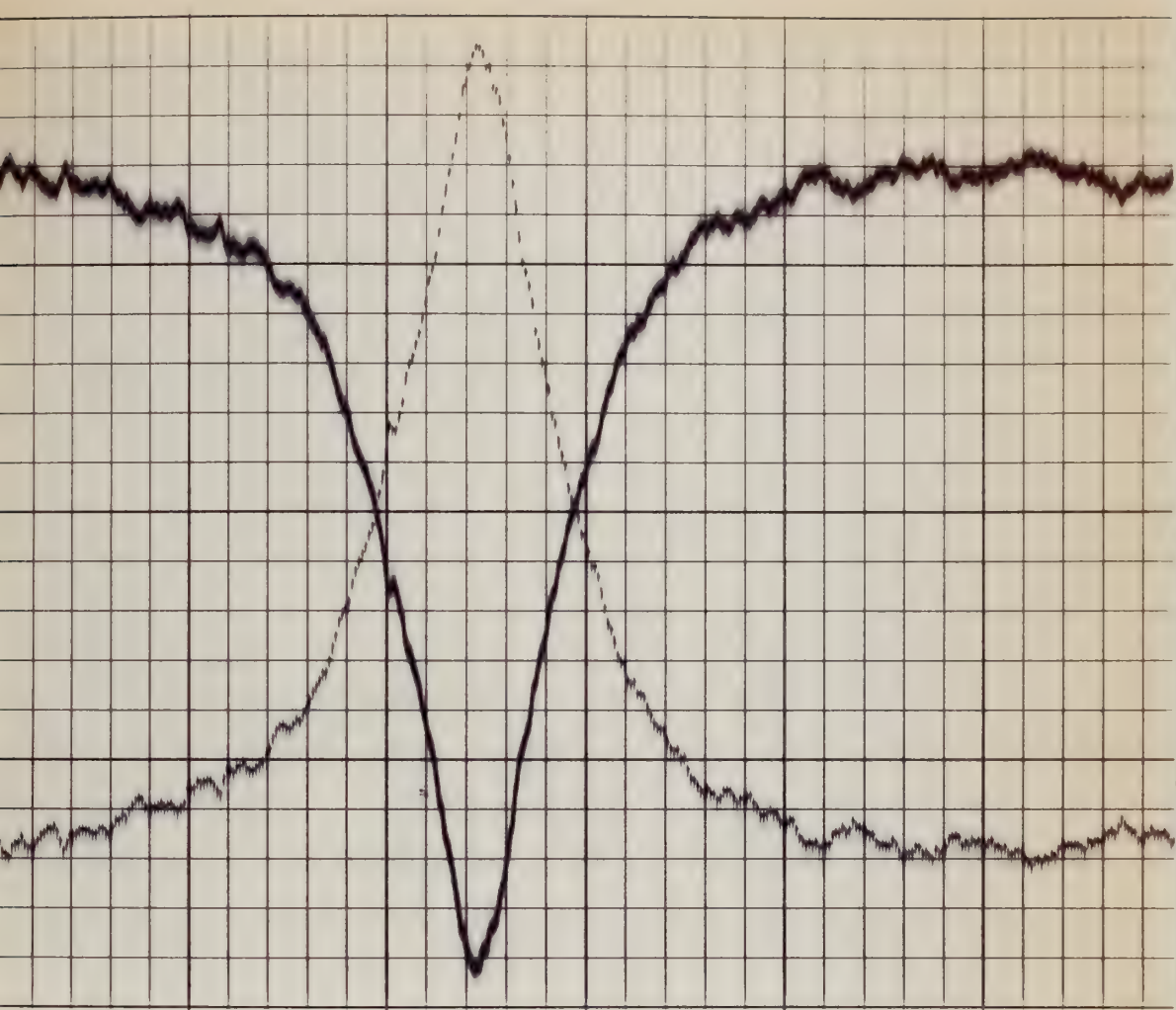
INDEXING RECORD

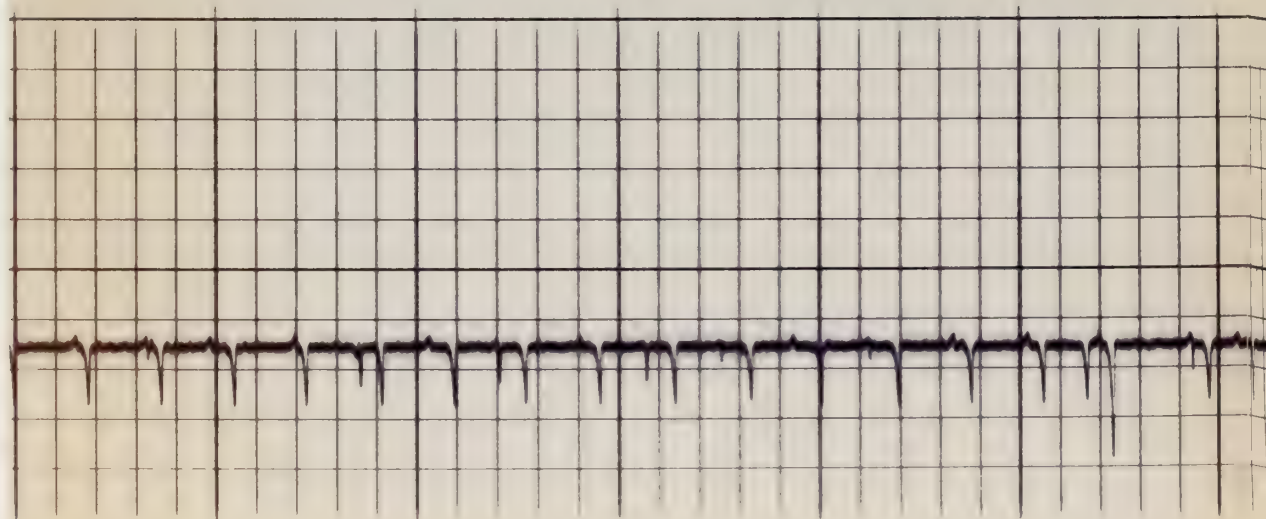
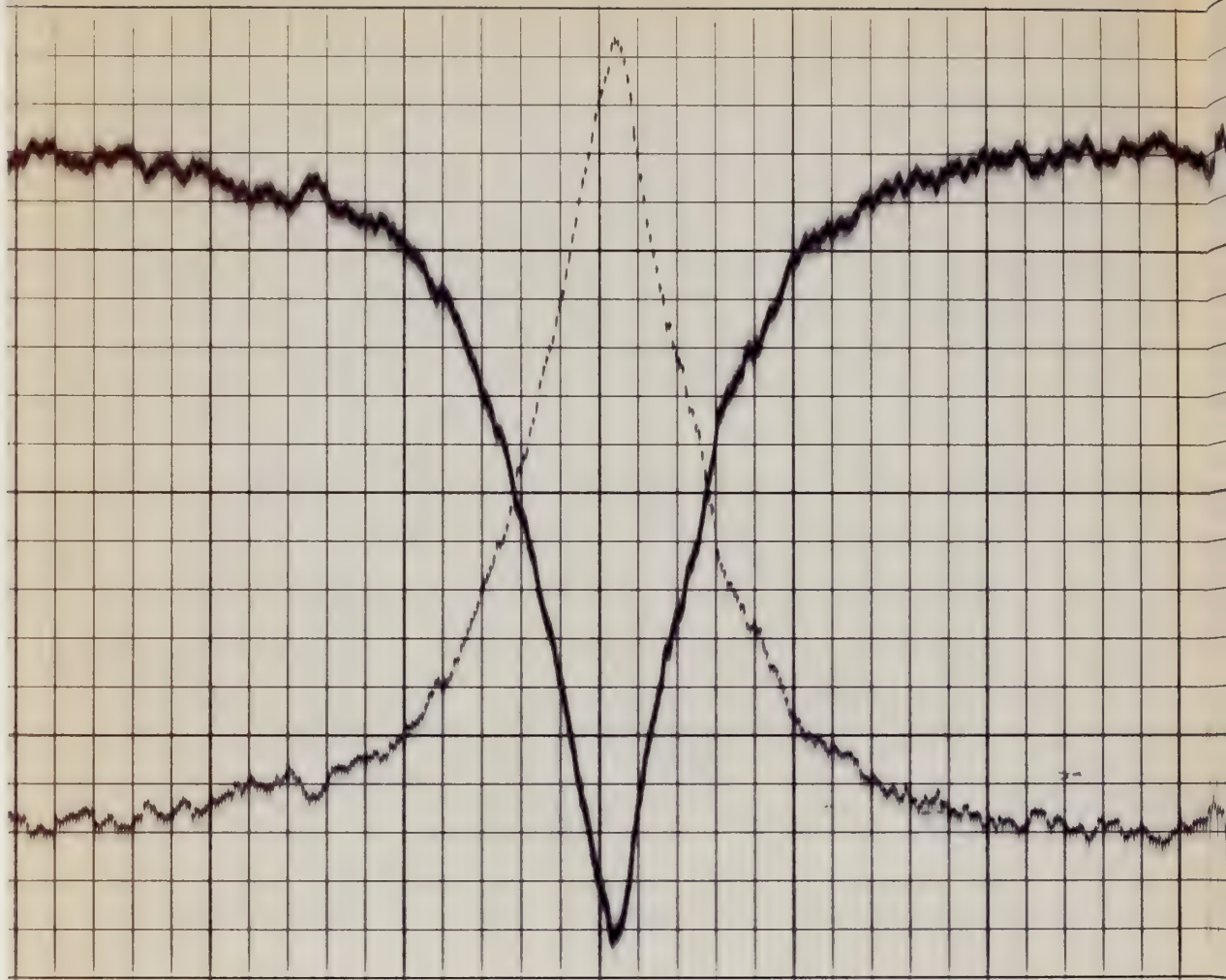


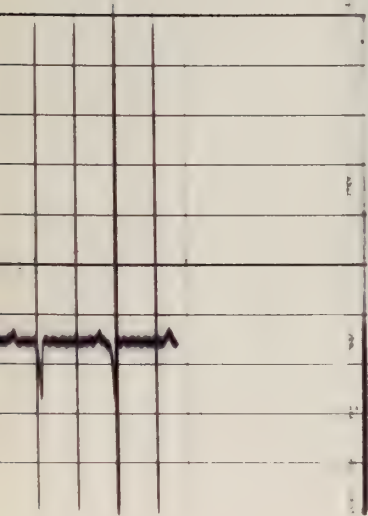
TYPICAL ORIENTING
RECORD NO. 1
LUNG STRING
PERFORATED 1335-1345

RADIOIRADIATION RECORD





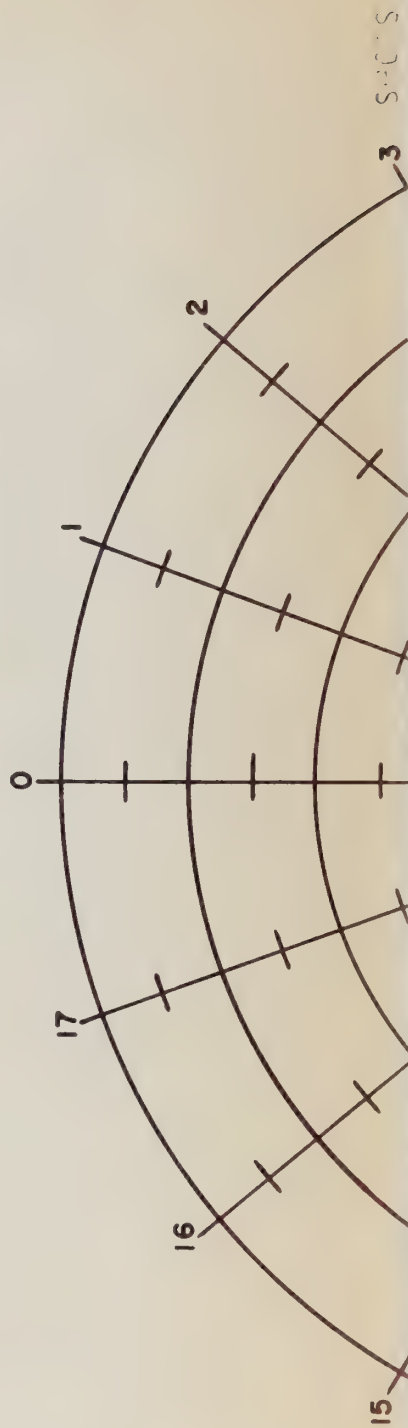


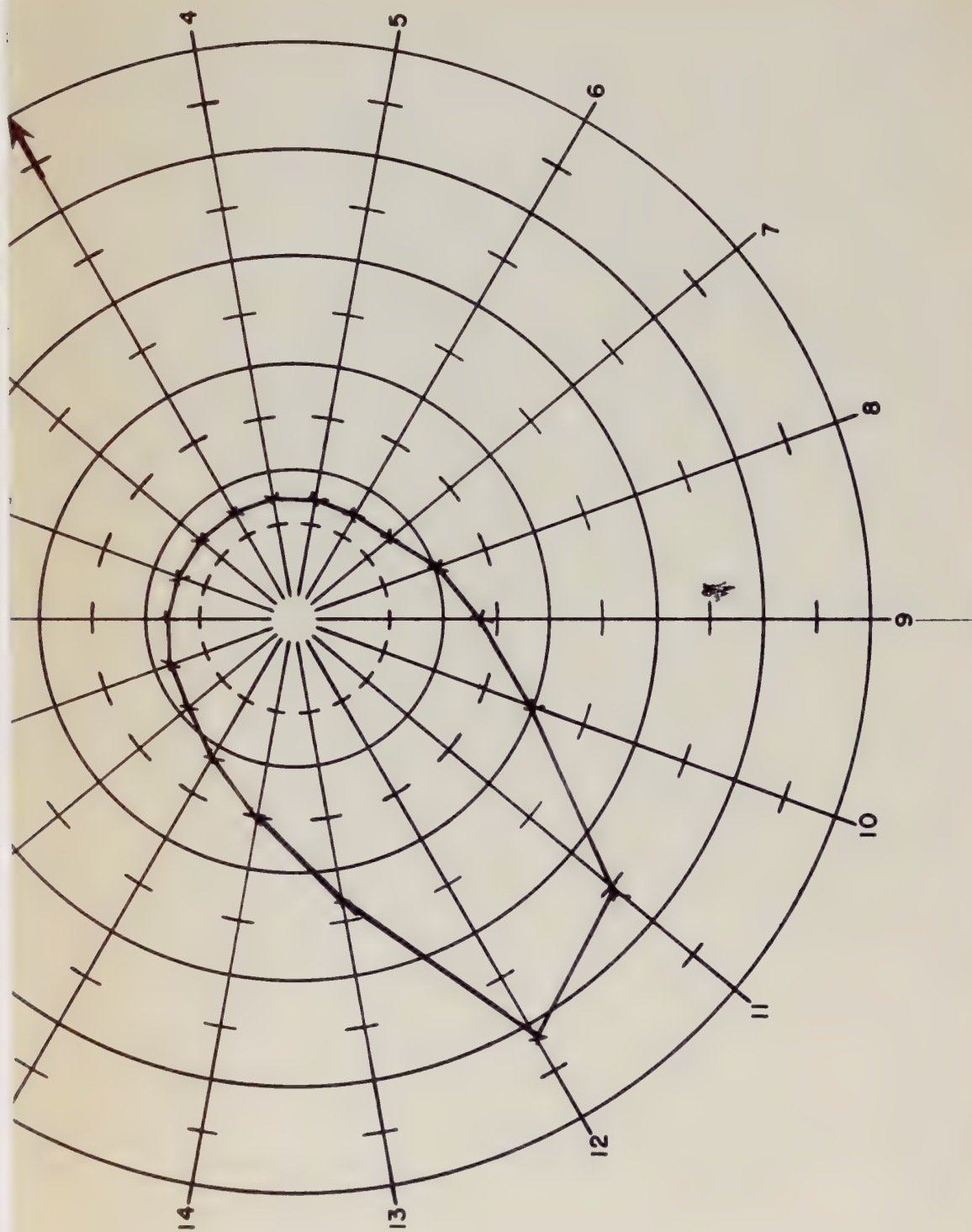


RADIO-ORIENTATION PLOT

POT-B

NO. 1 LONG STRING PERFORATED 1335-1345 ONE SHOT PER FOOT WITH 1 11/16" HYPERTONE



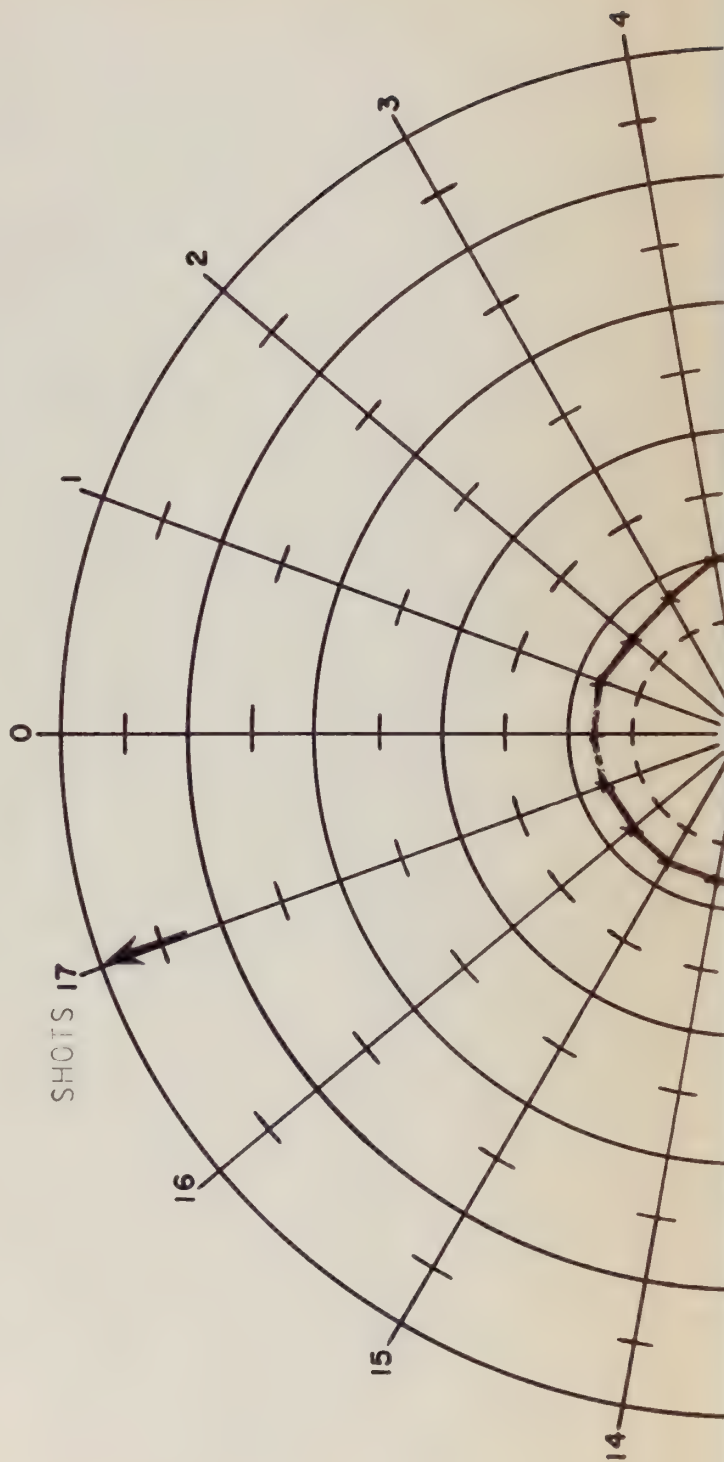


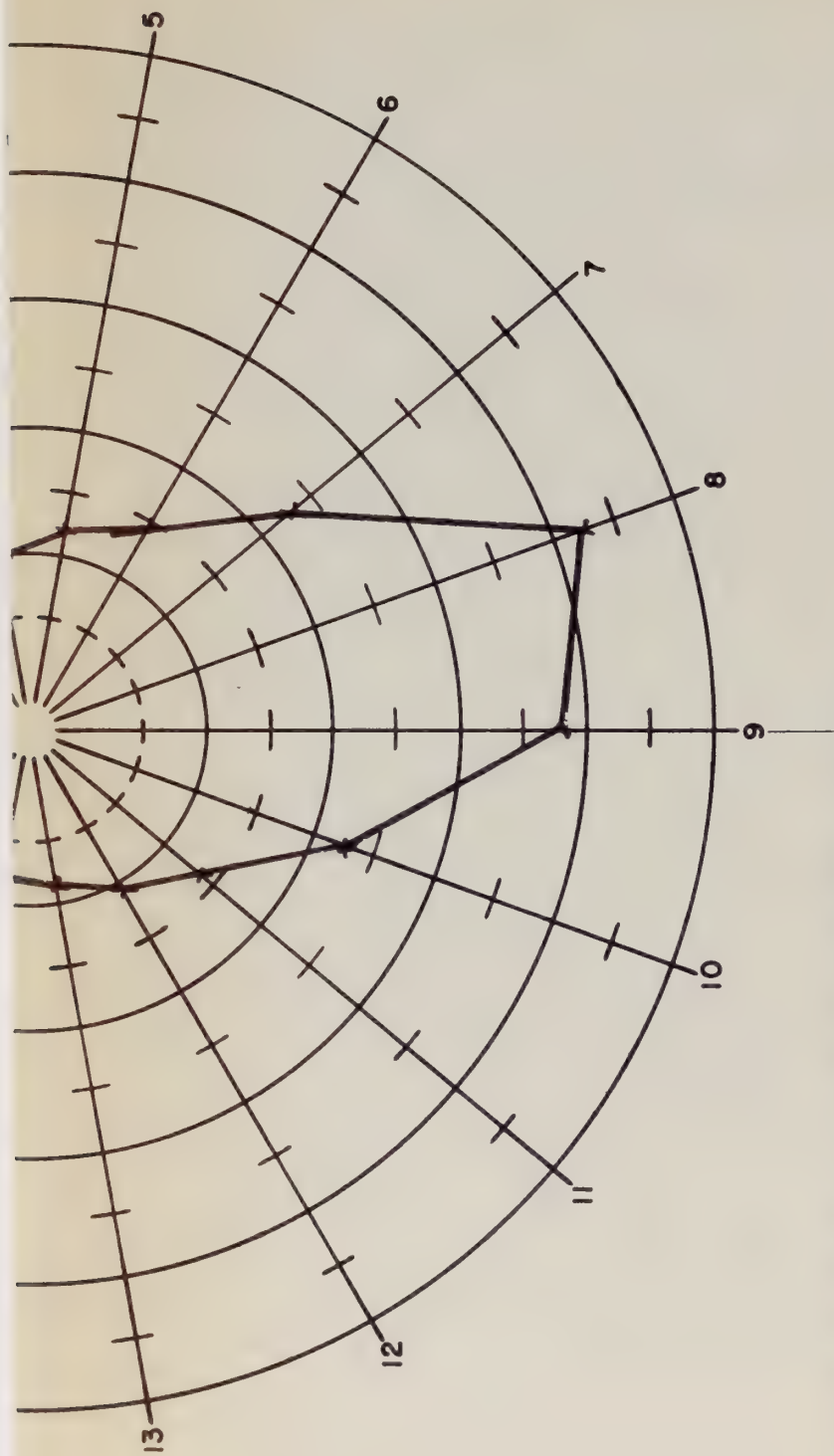
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other factors not shown.

RADIOORIENTATION PLOT

POT-B

NO. 1 LONG STRING PERFORATED 1324 1334 ONE SHOT PER FOOT WITH 1 11/16" H-PERDSOME





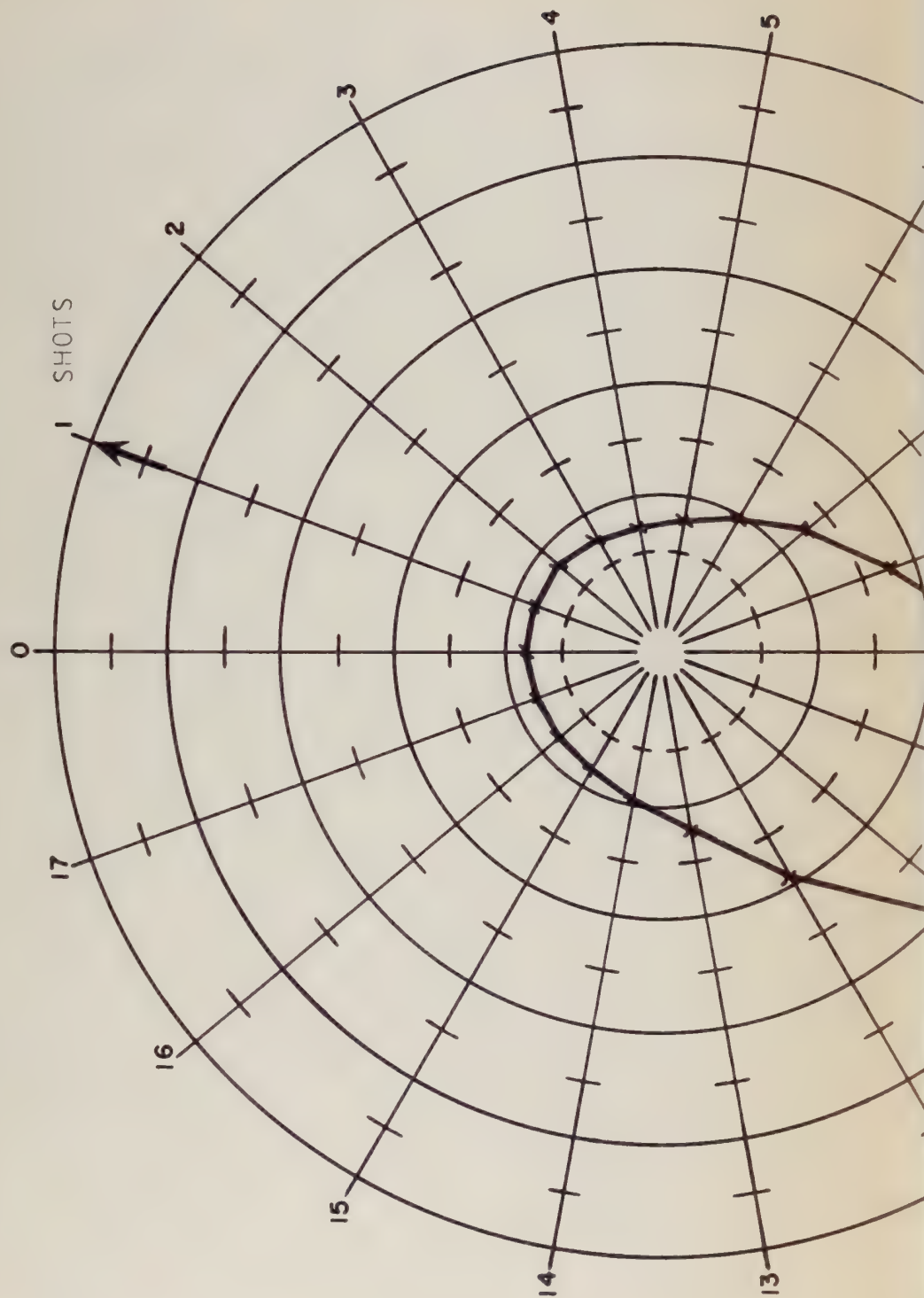
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

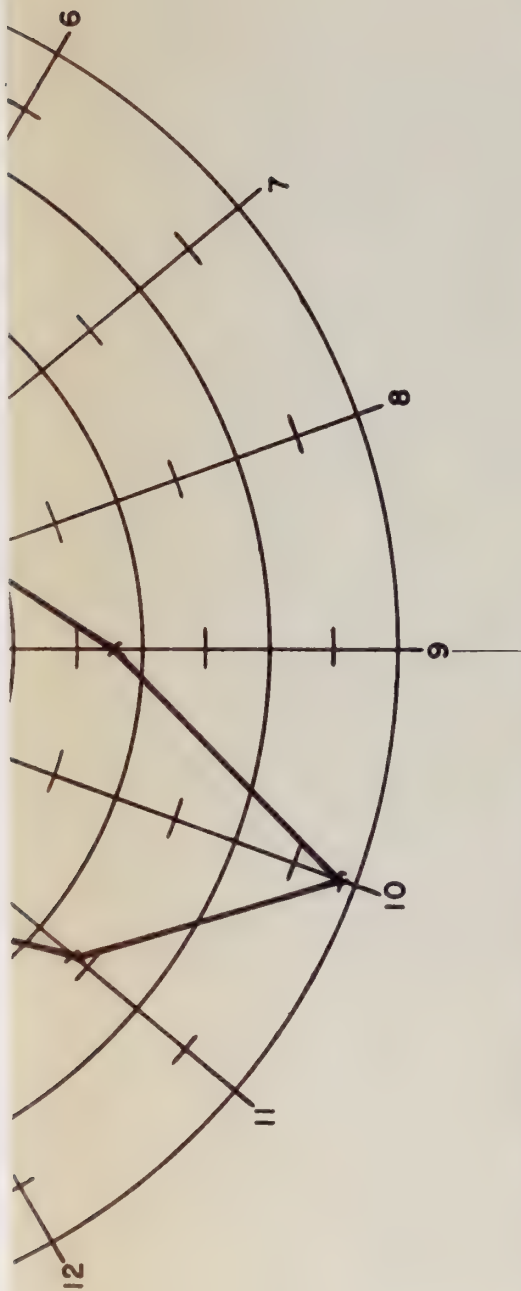
Schlumberger

ORIENTATION LEVEL

POT-B

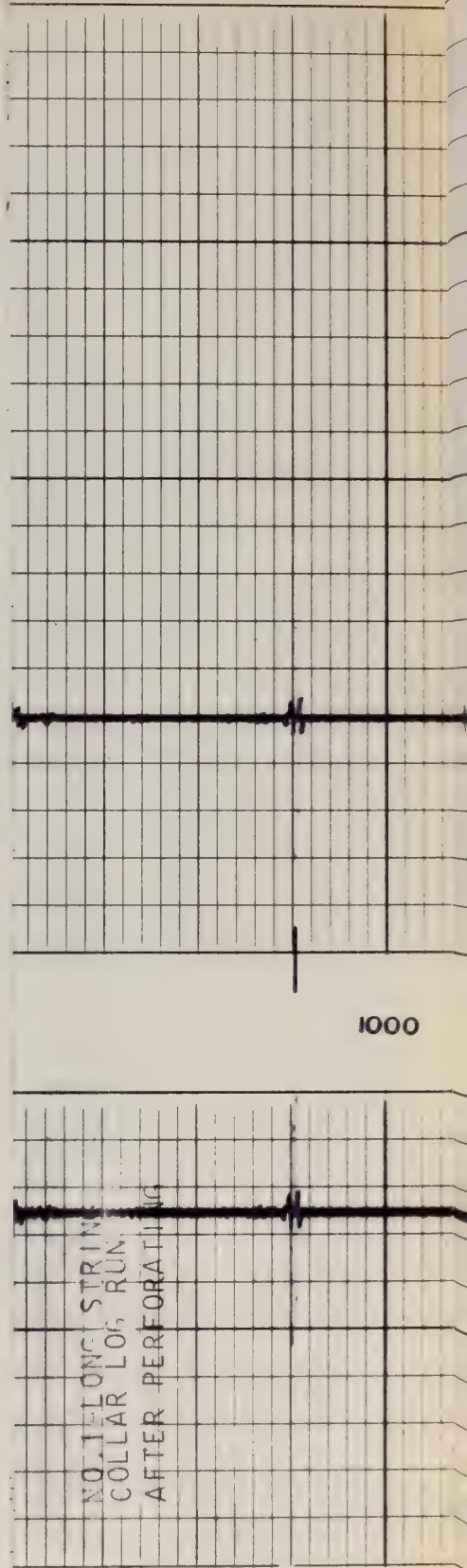
AC.1 LONG STRING PERFORATED 1316-1323 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

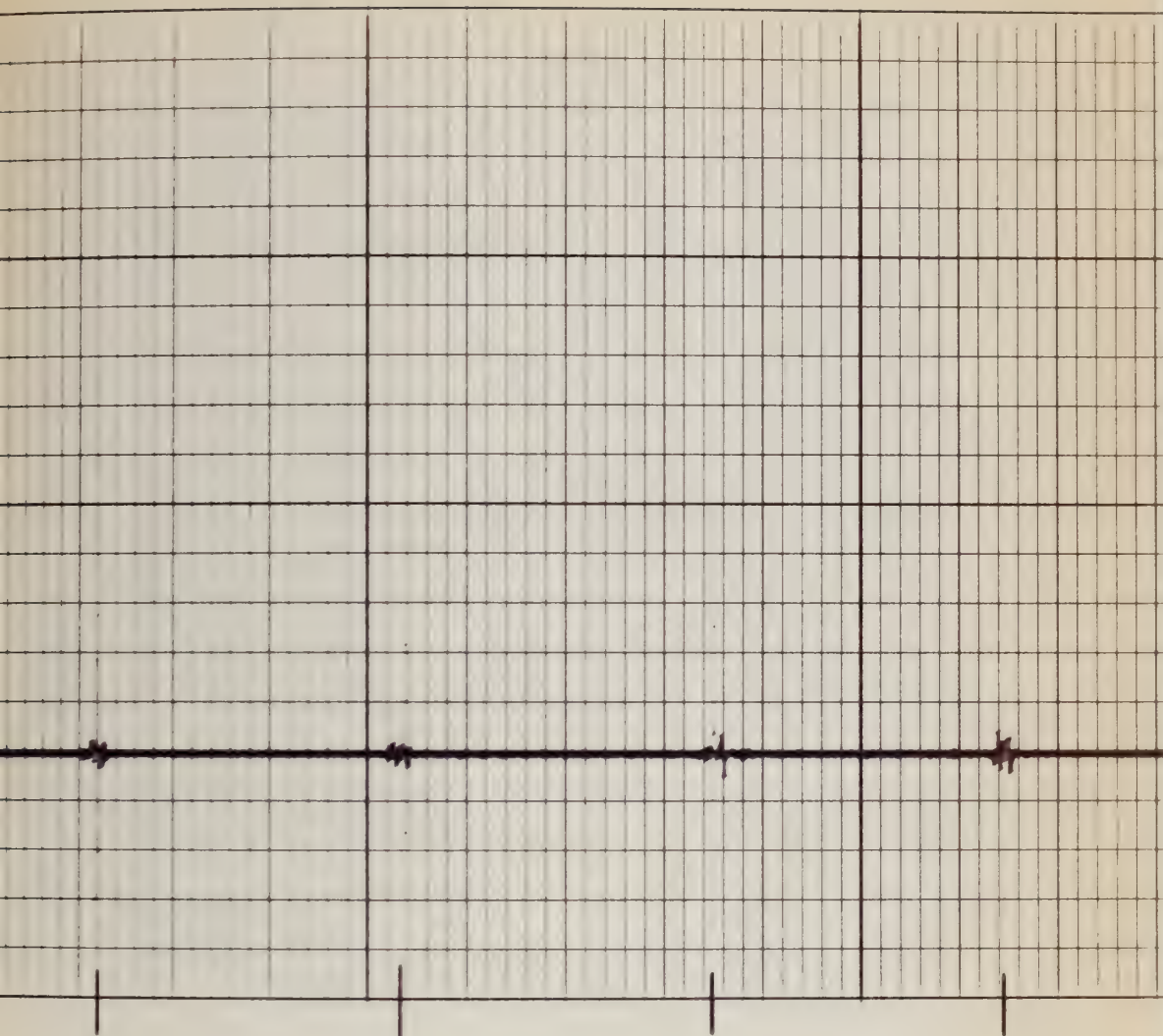




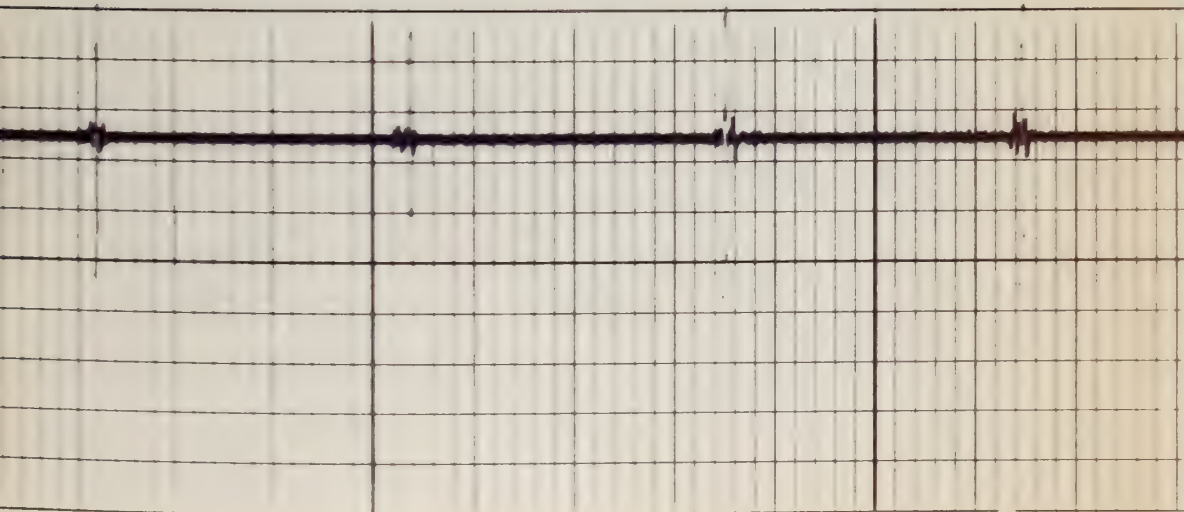
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

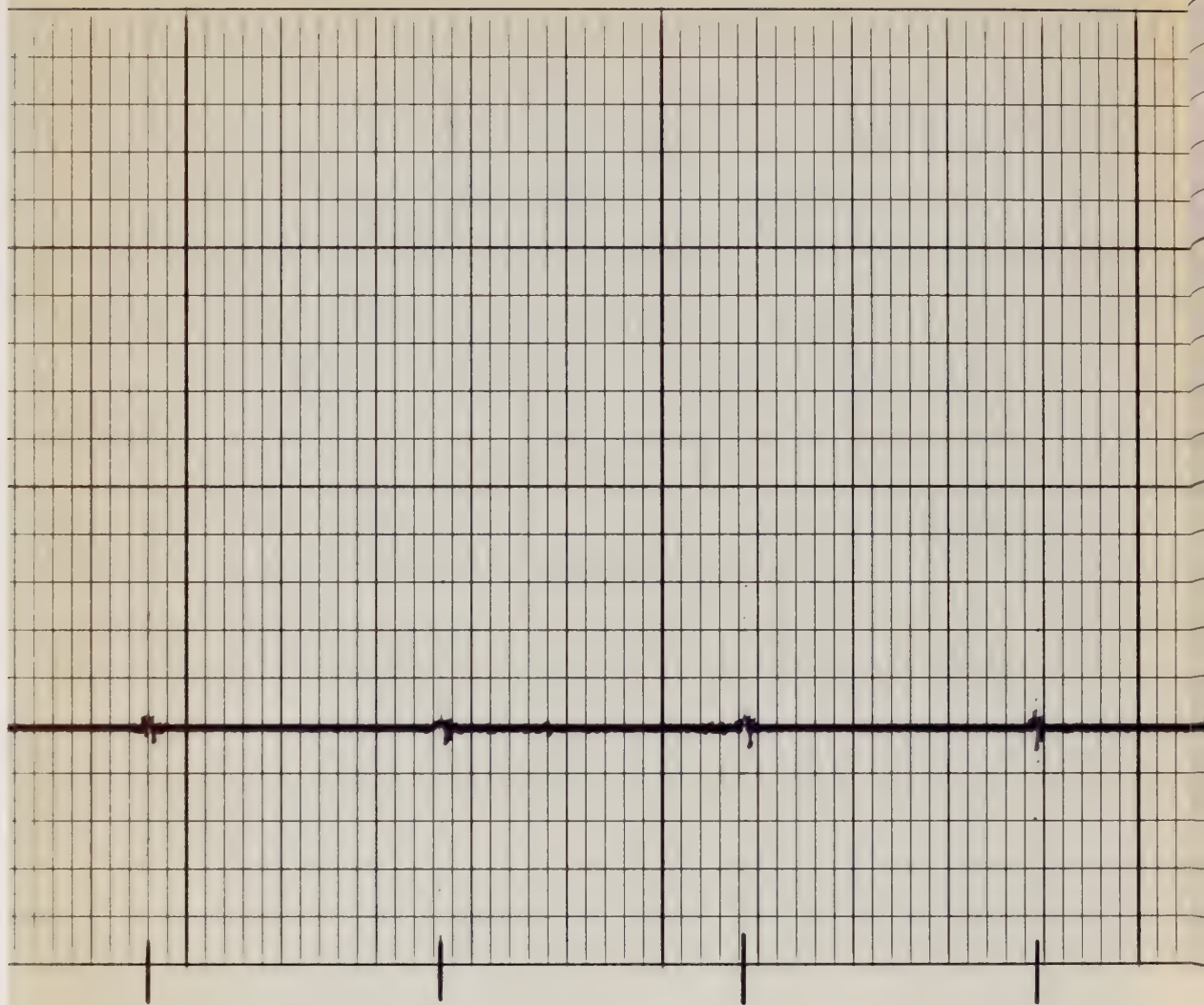
Schlumberger



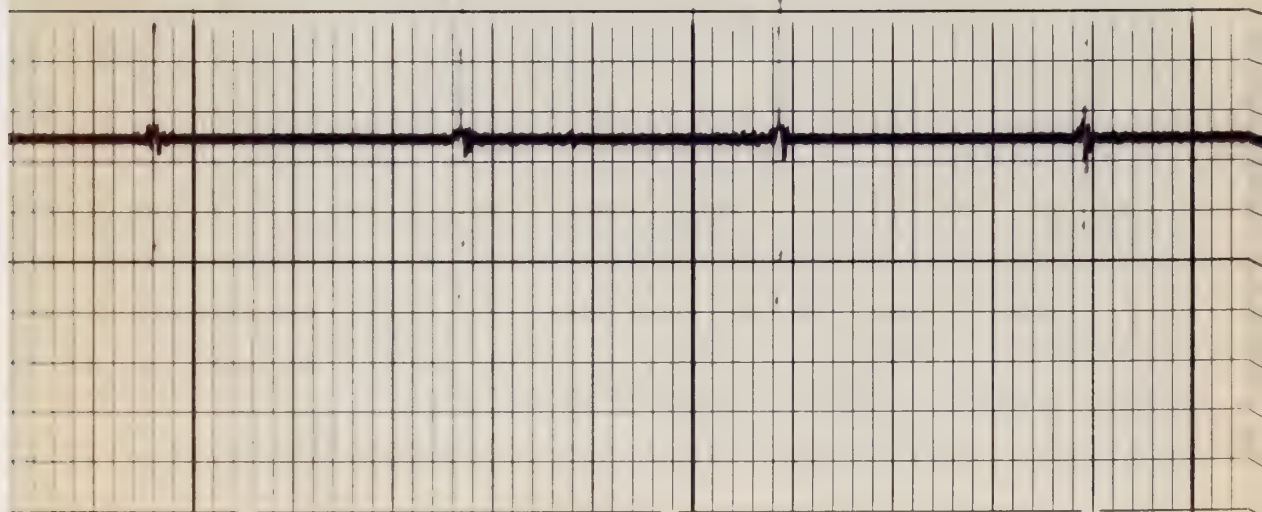


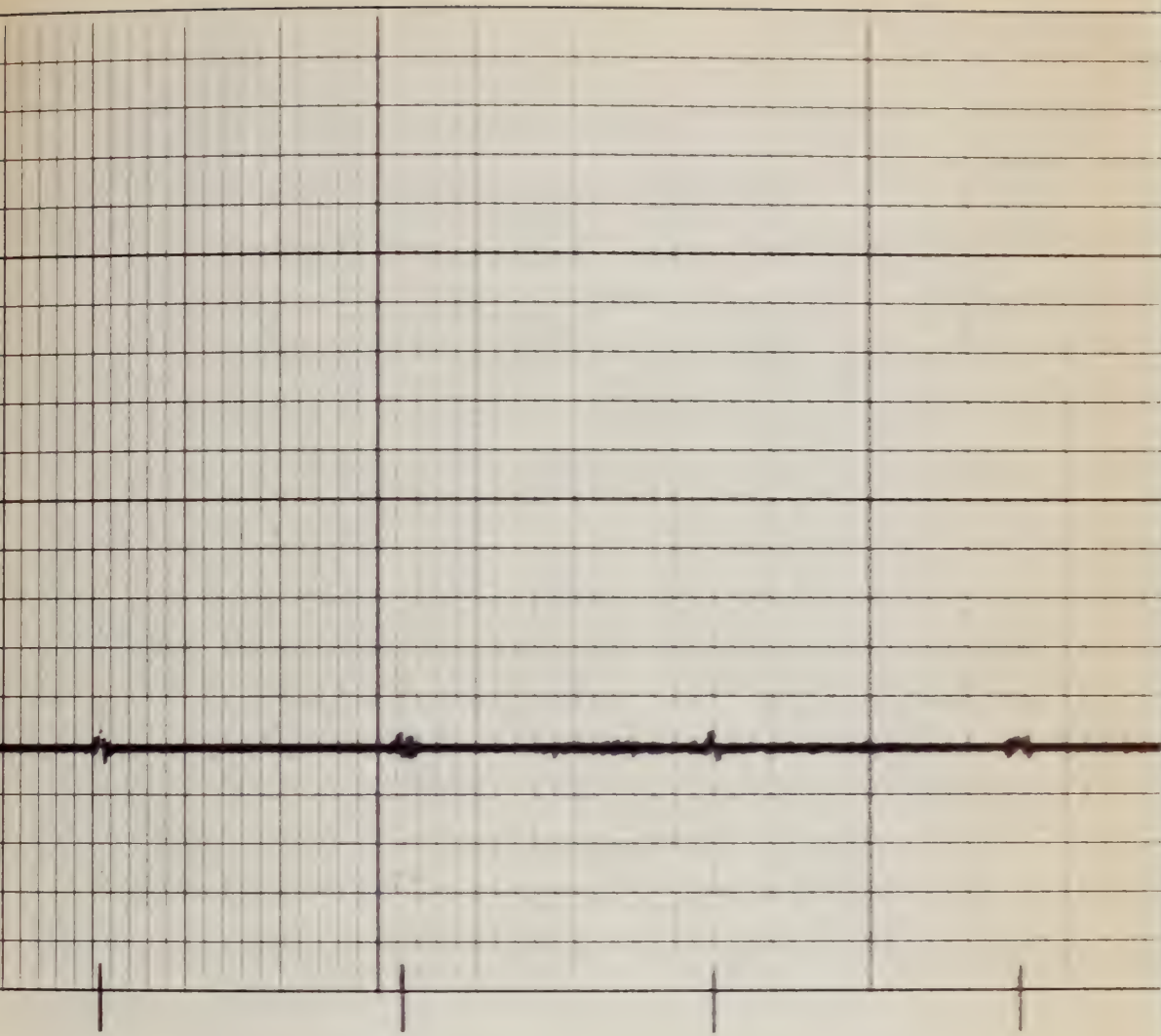
1100



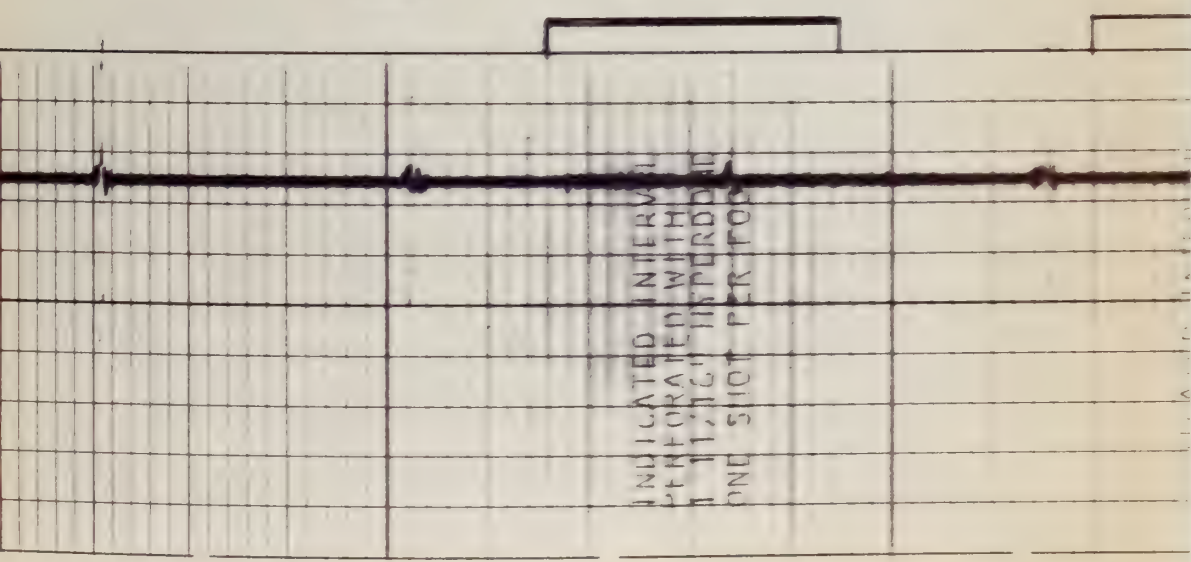


1200





300



INDICATED INTERVAL
PERFORMED WITH
A 11.75" INTERVAL
ONE SHOT PER FOOT

PERFORATED ONE SHOT
PER FOOT WITH
1 11/16" HYPERDOME

INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH
1 11/16" HYPERDOME

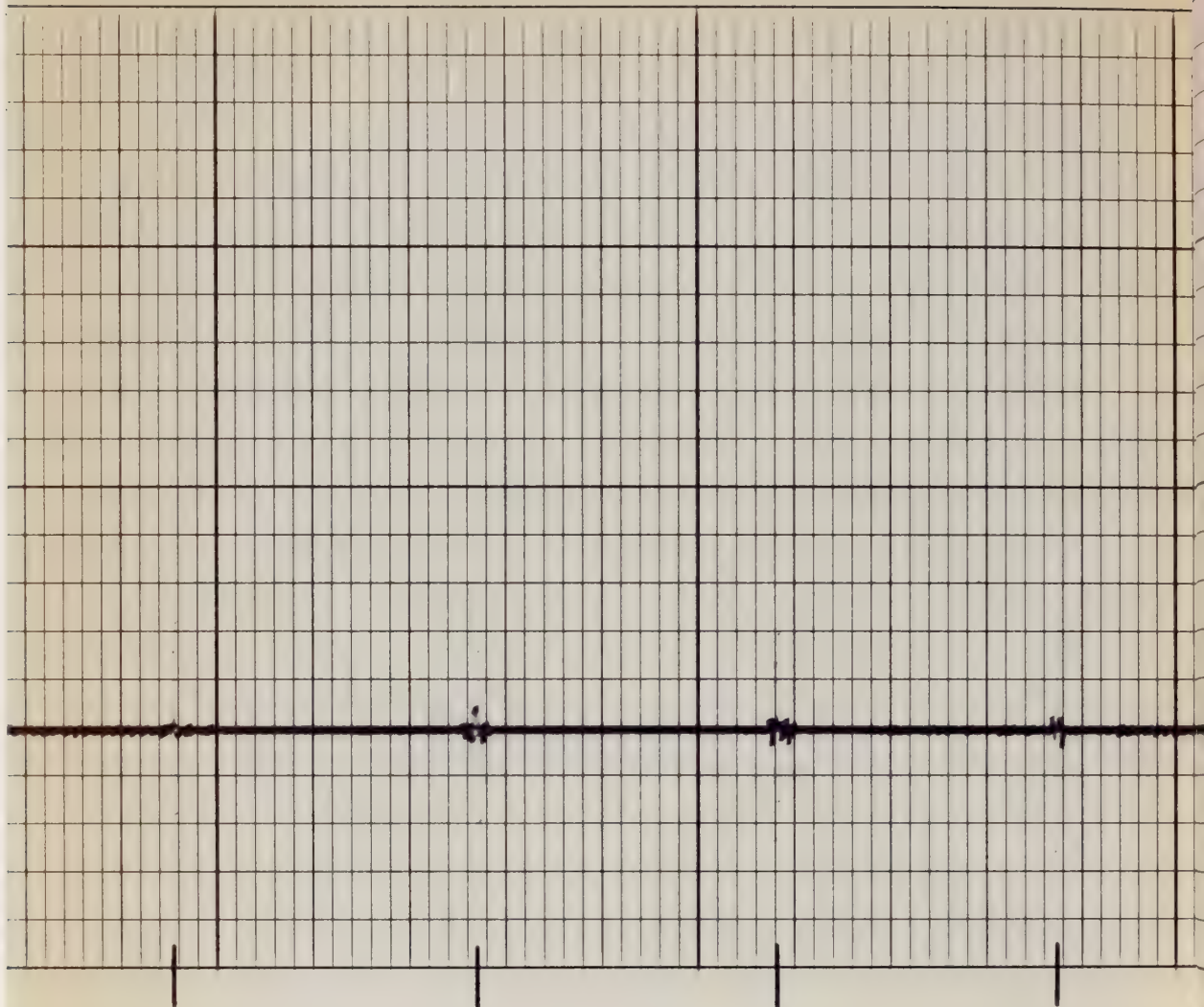
INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH
1 11/16" HYPERDOME

1400

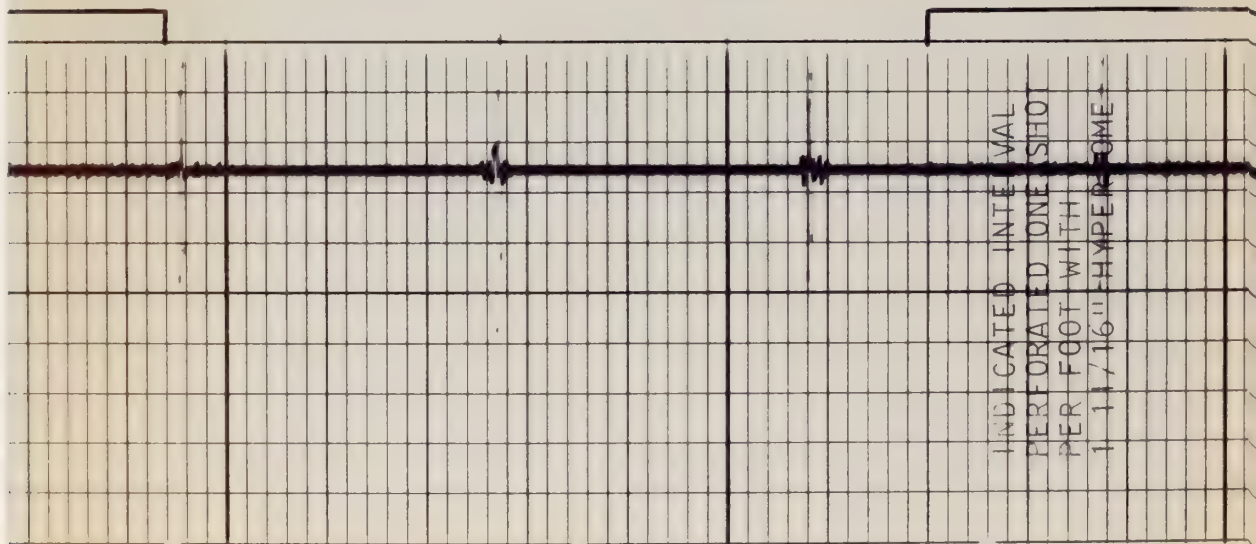
1500



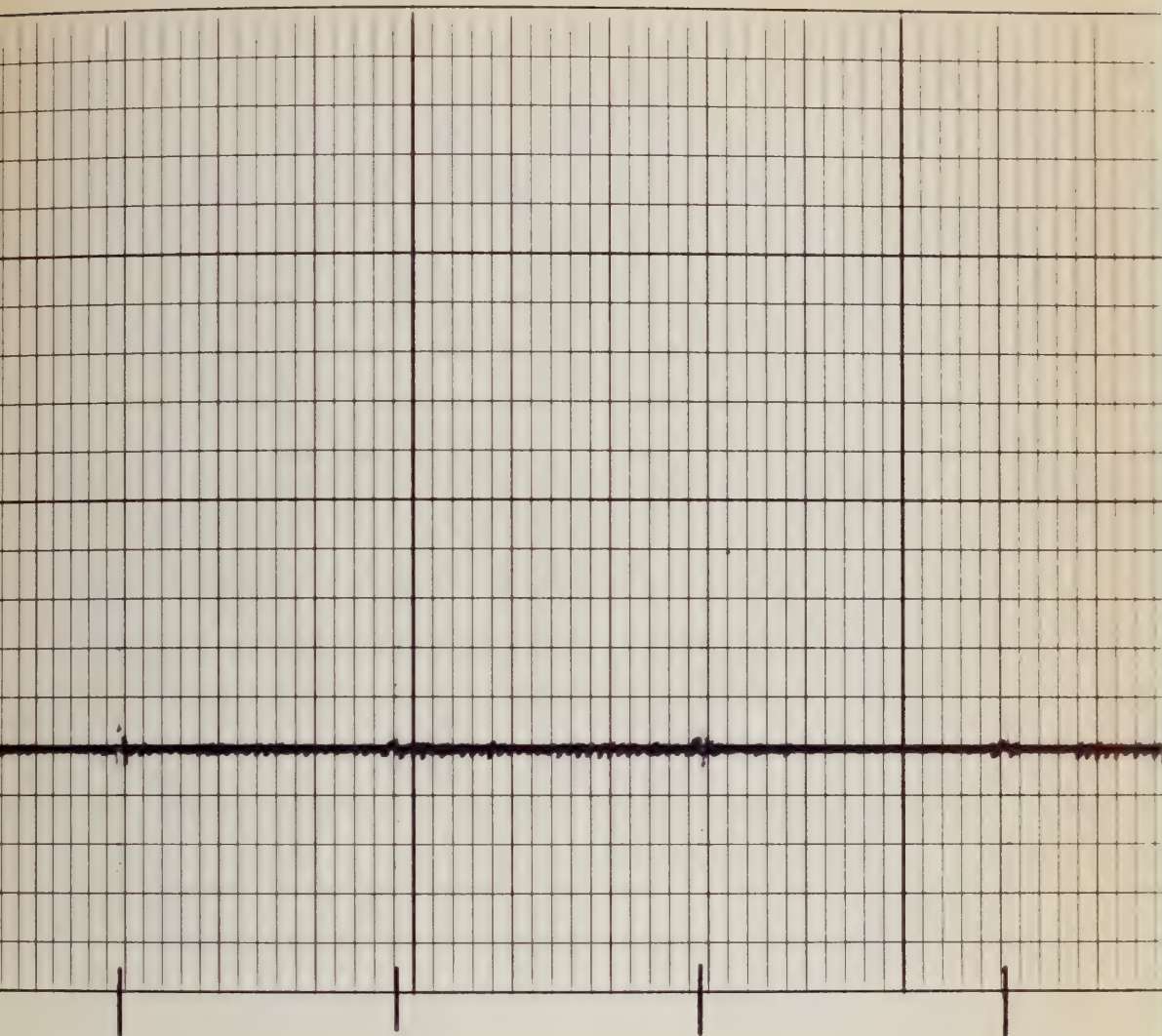
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110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200



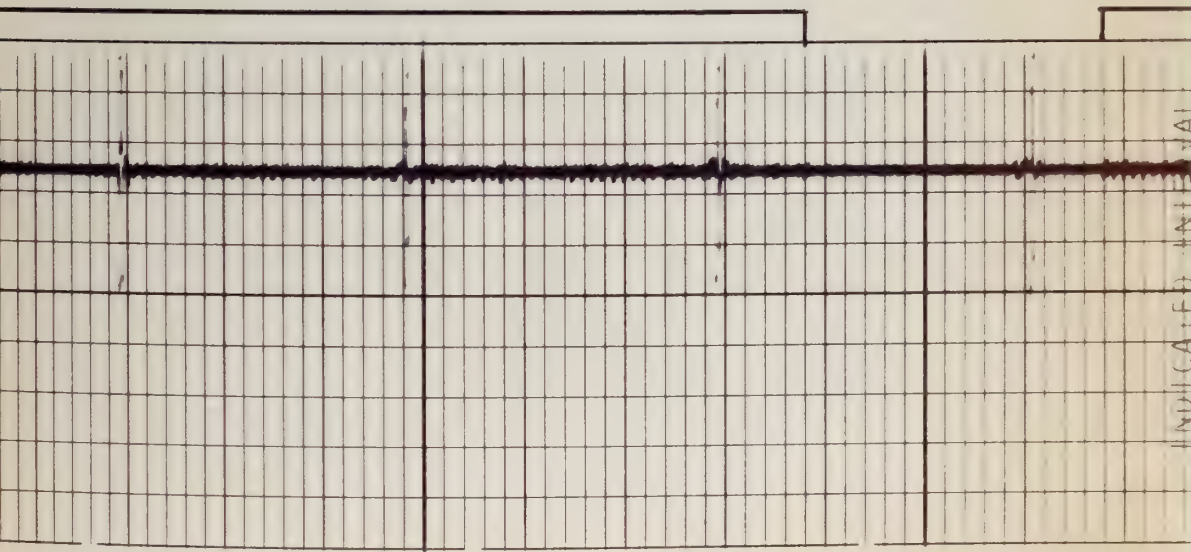
1700



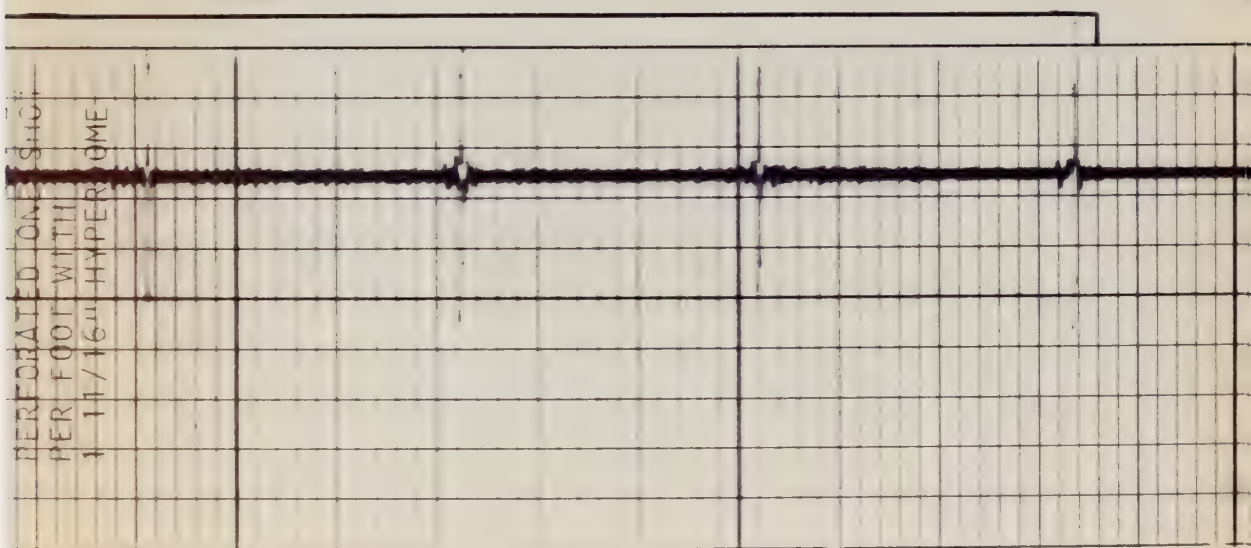
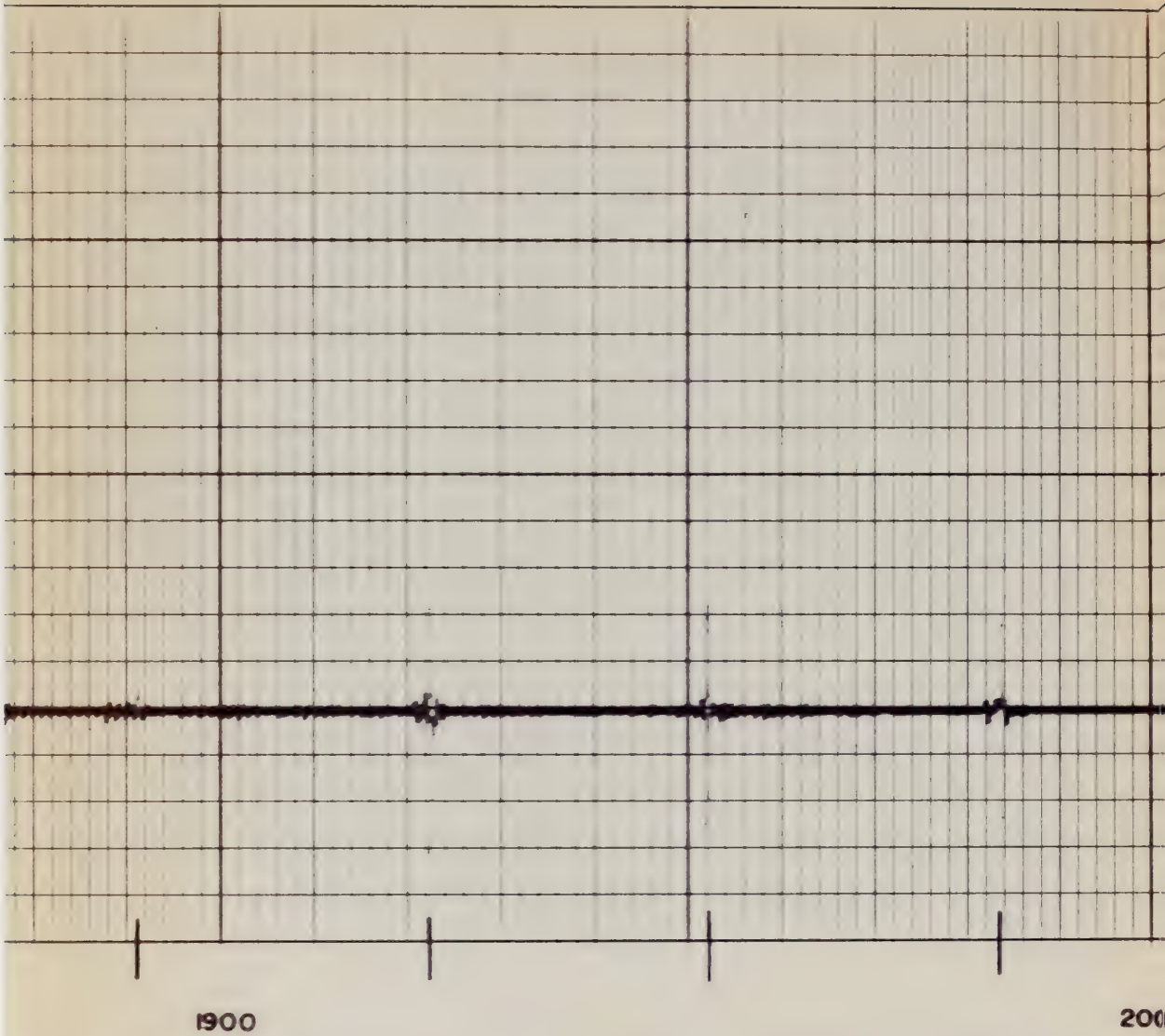
INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH
1 11/16" HYPER-COME

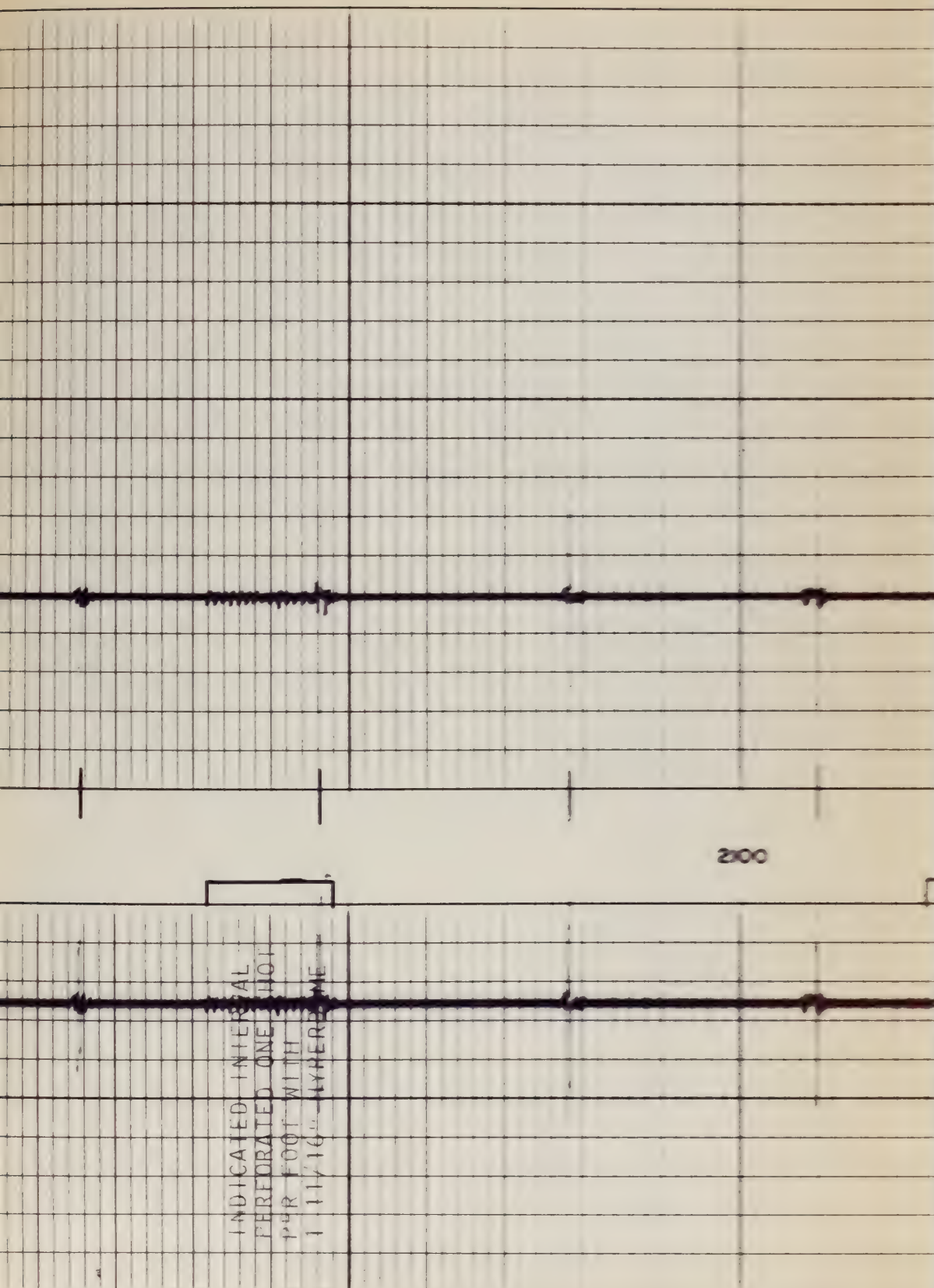


1800



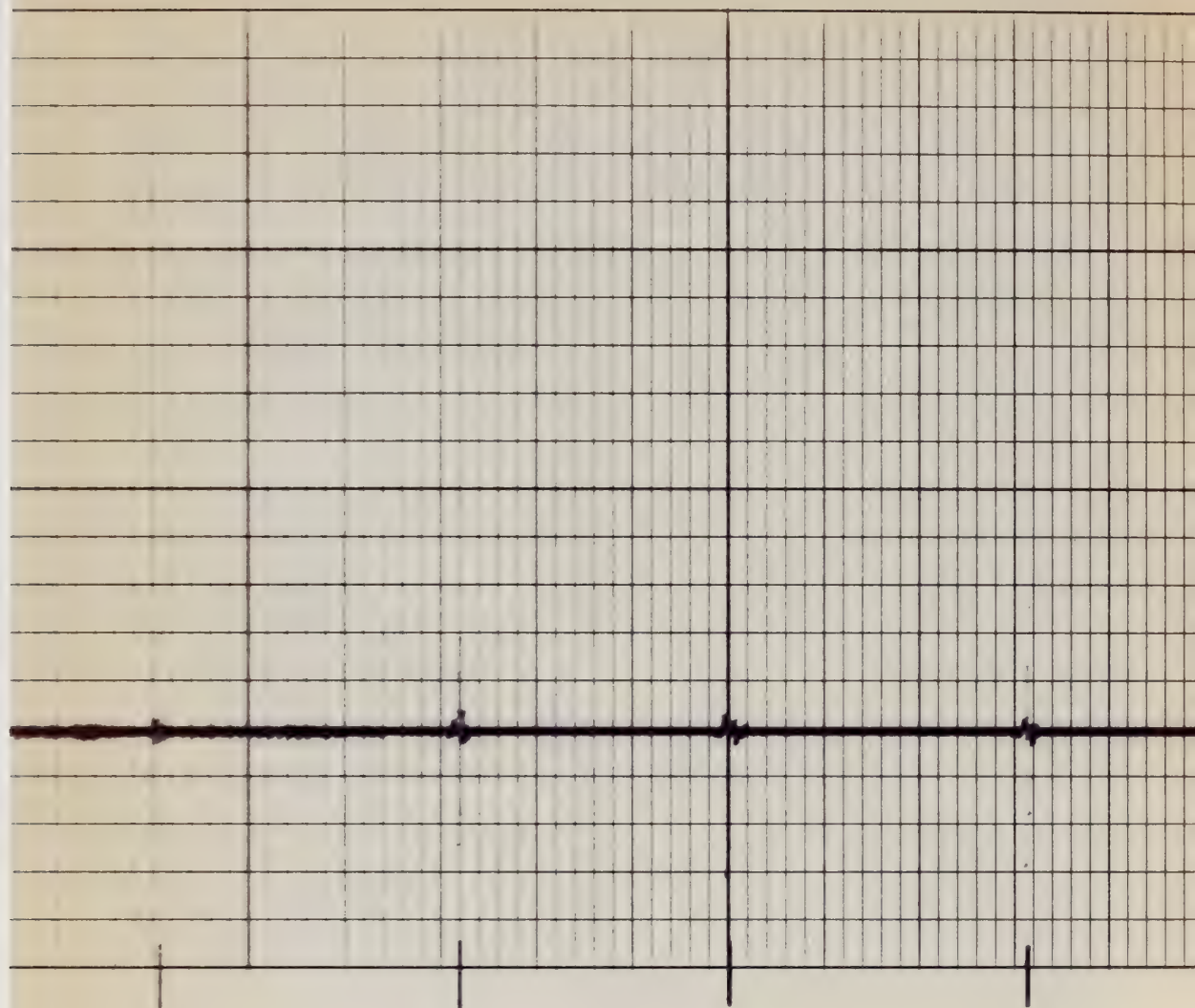
INDICATED INTENSITY



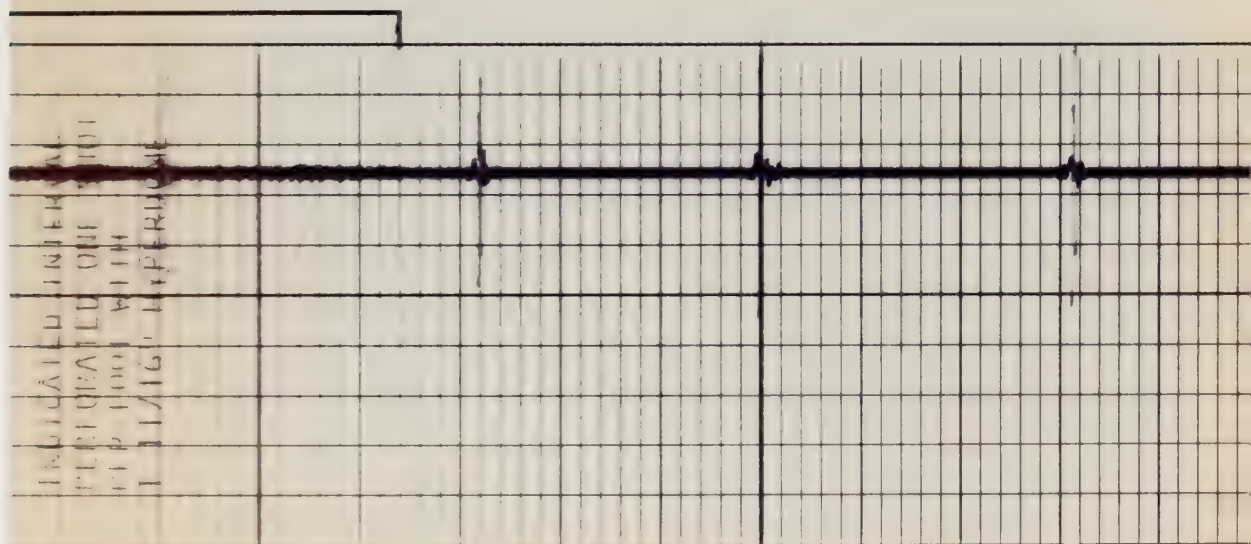


200

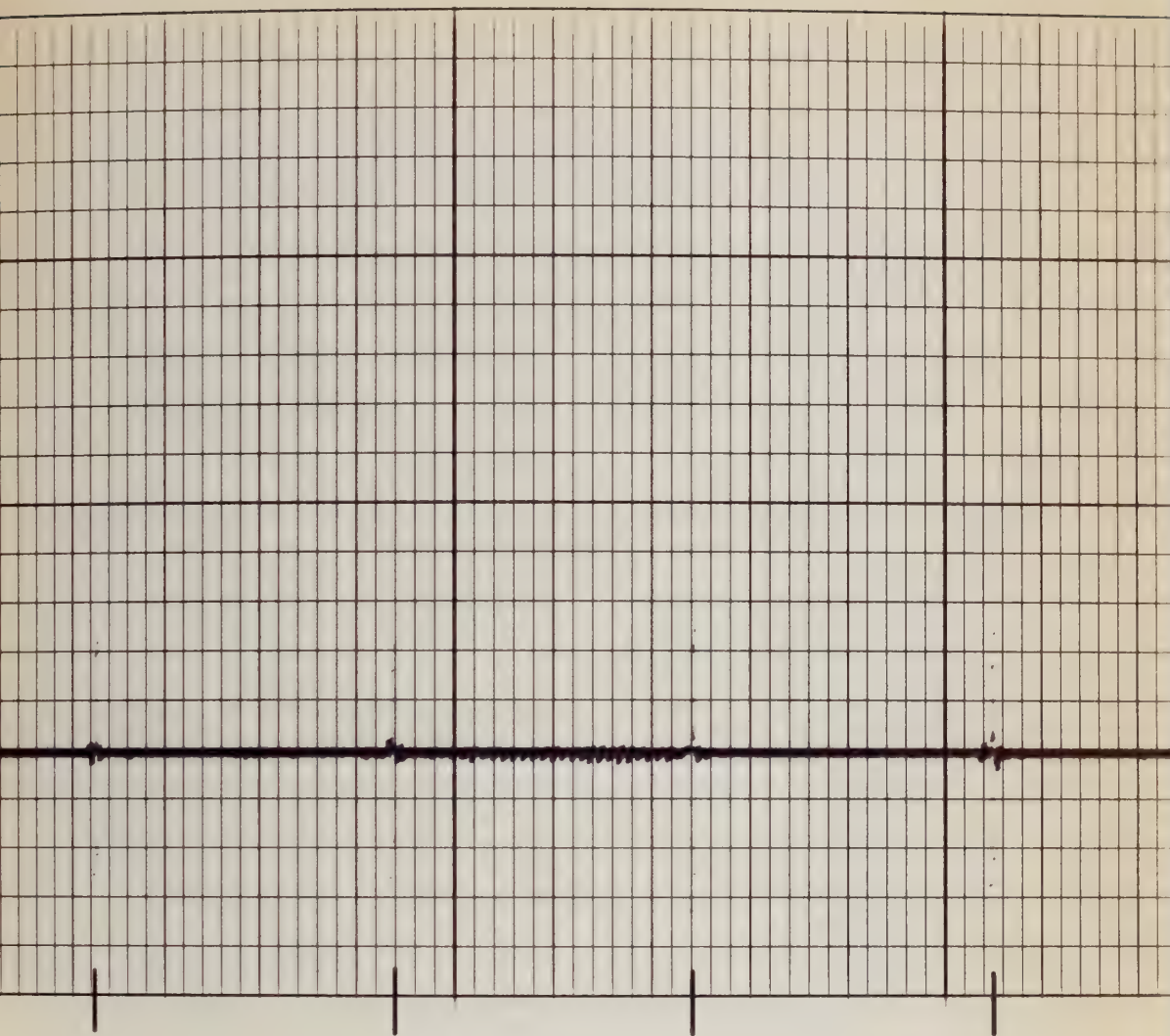
INDICATED INTERVAL
PERFORATED ONE
PER FOOT WITH
1 11/16" HYPEREXTENSION



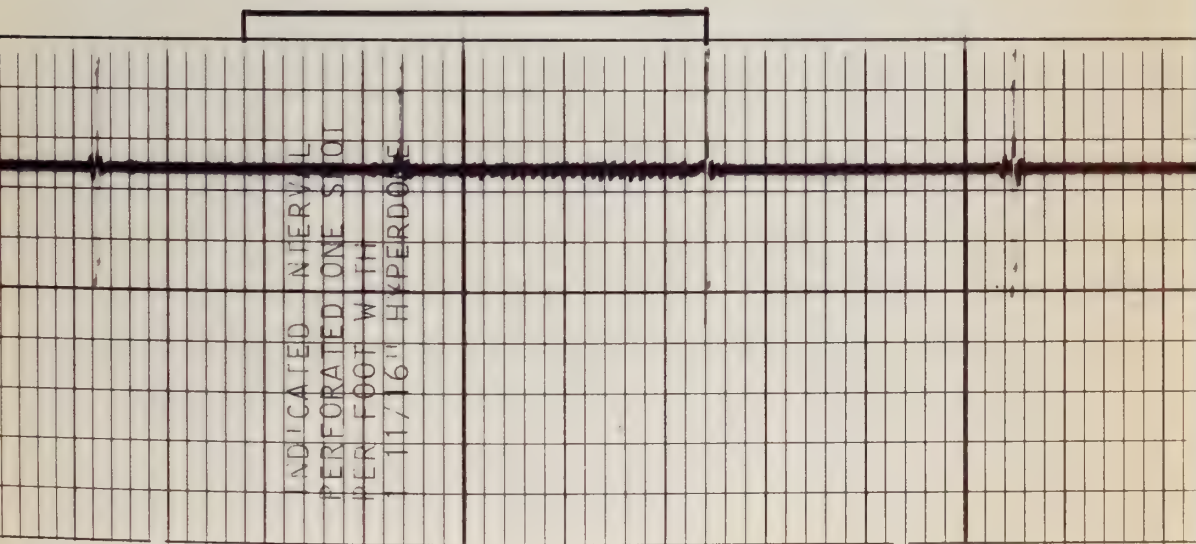
2200



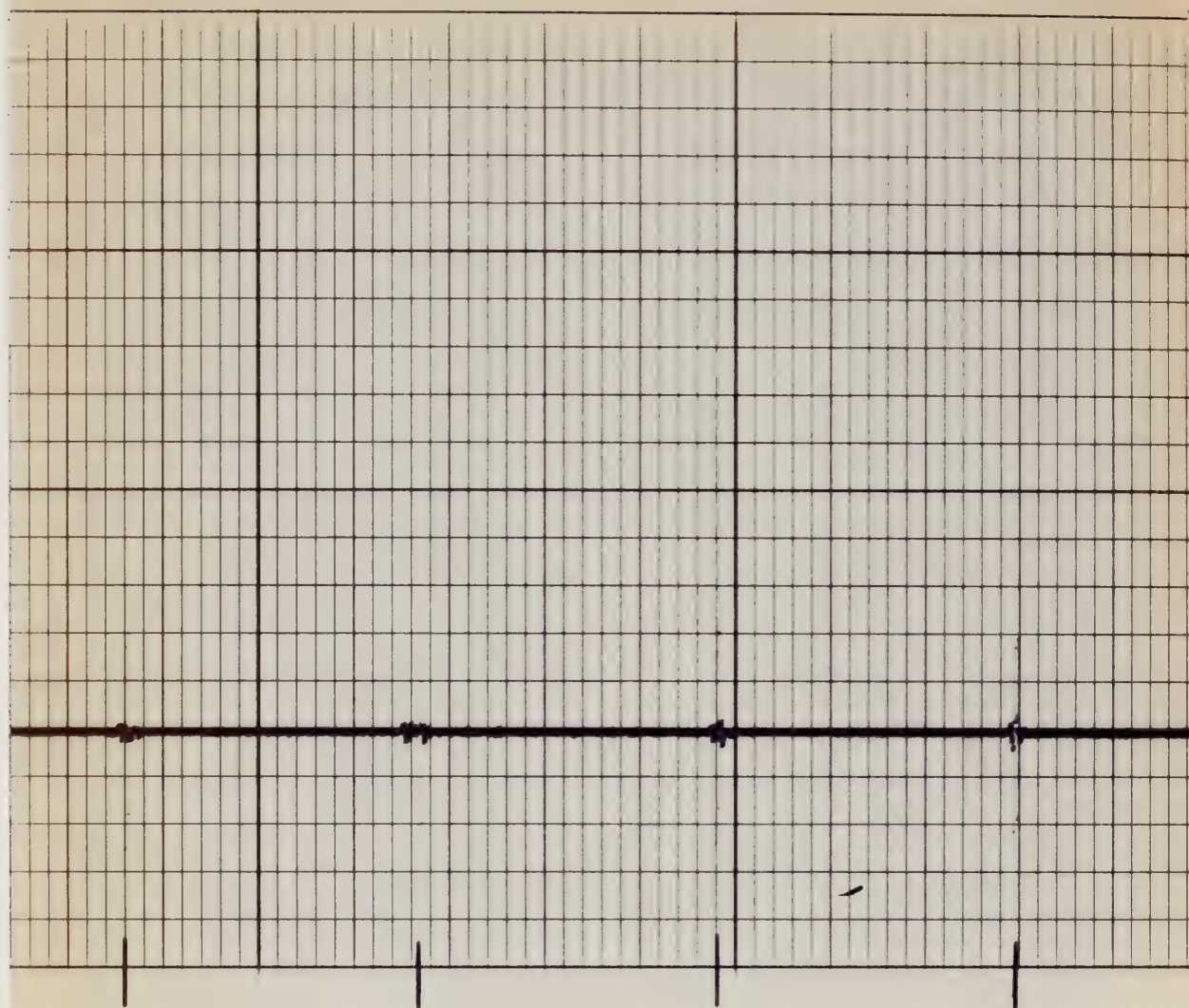
INDICATED INTERVAL
PERFORMED ON 10/1
11/16/16 PERFORME



2300

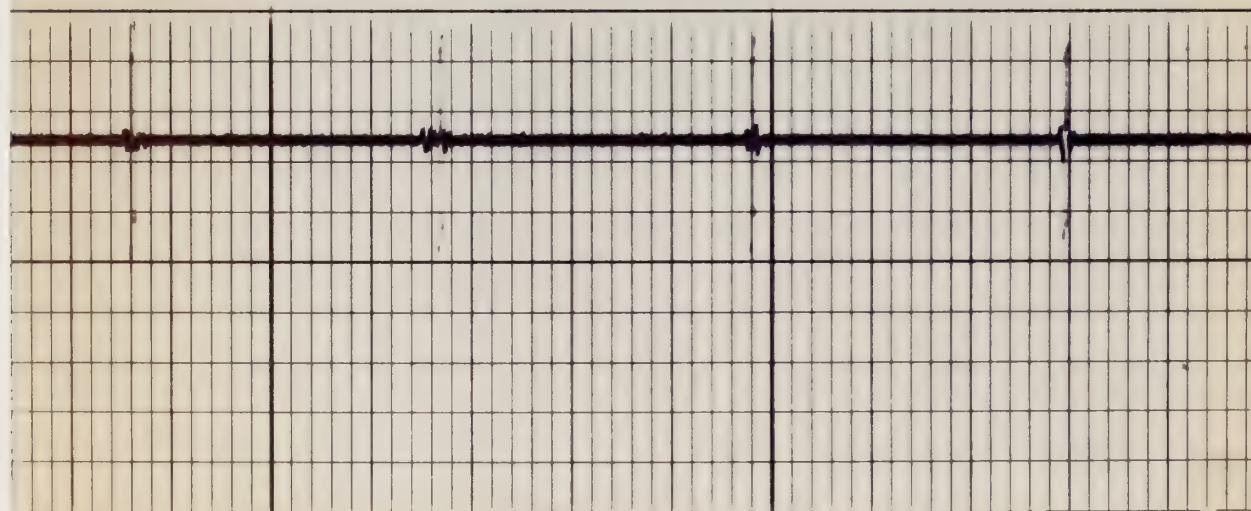


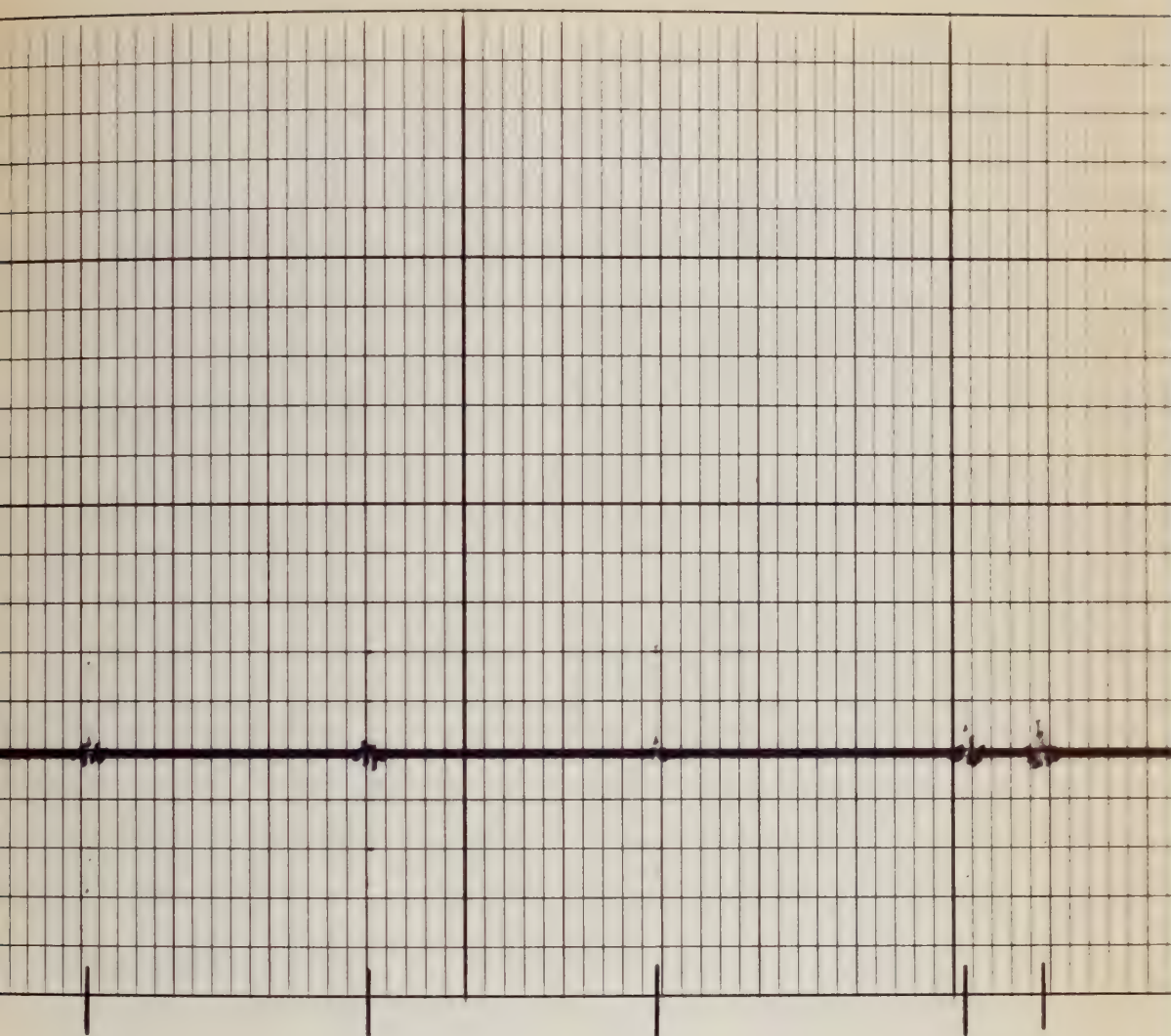
INDICATED NERVE
PERFORATED ONE STITCH
PER FOOT WITH
11/16" HYPERDUR



2400

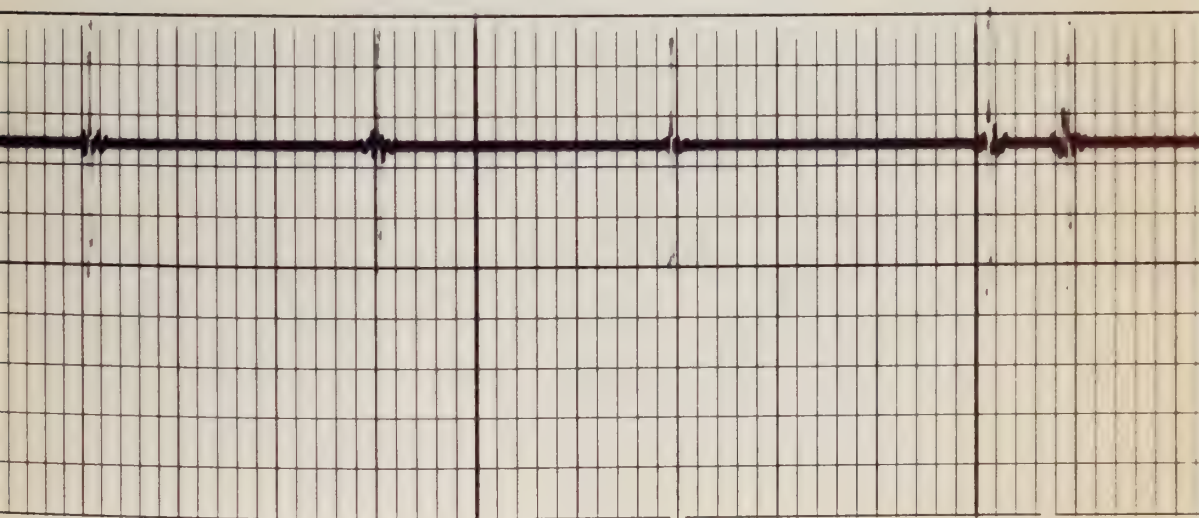
2

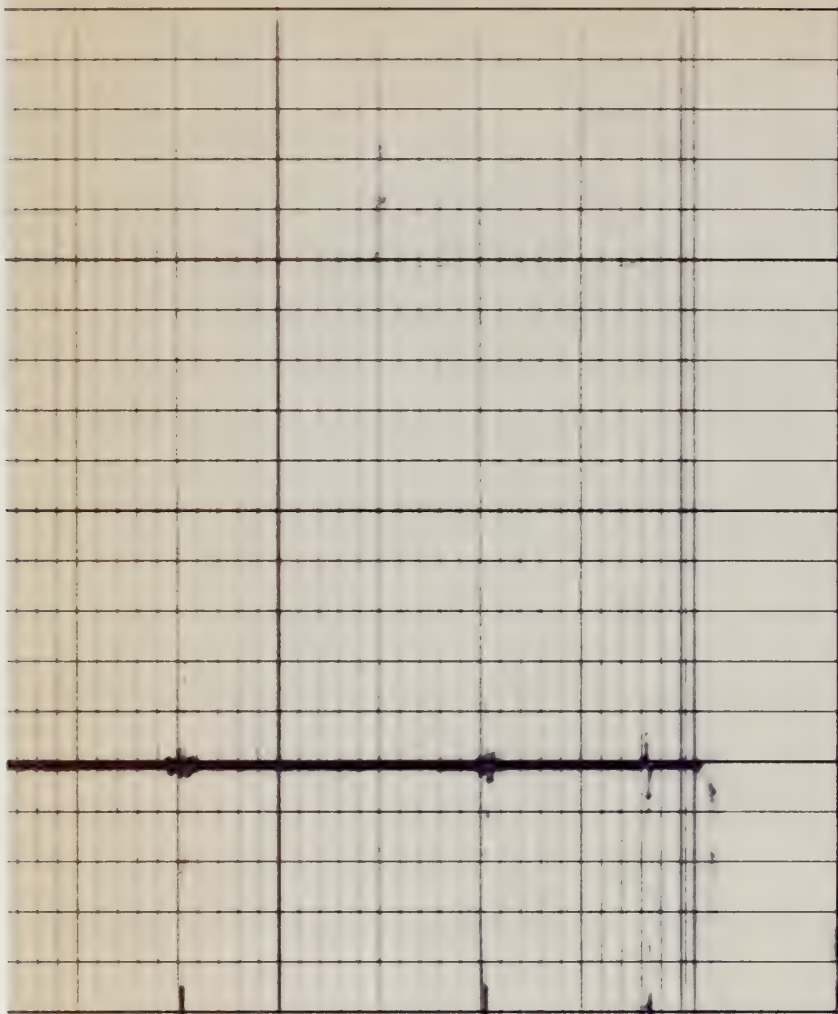




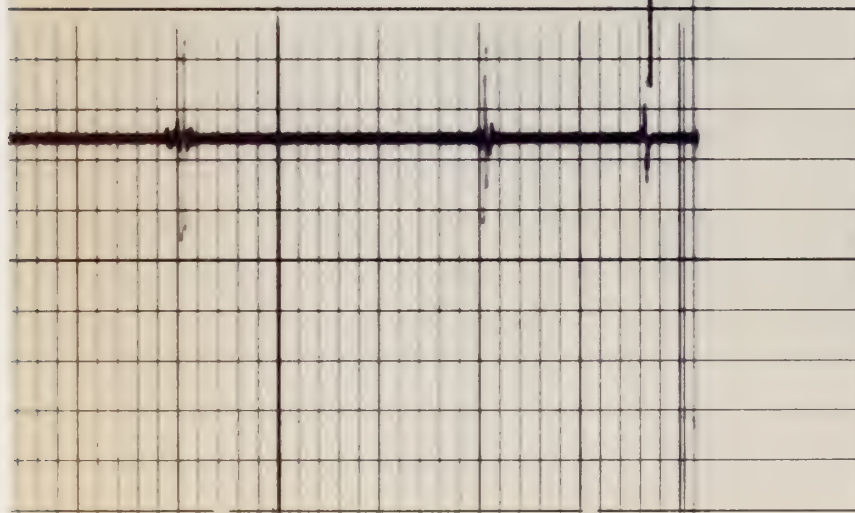
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2600





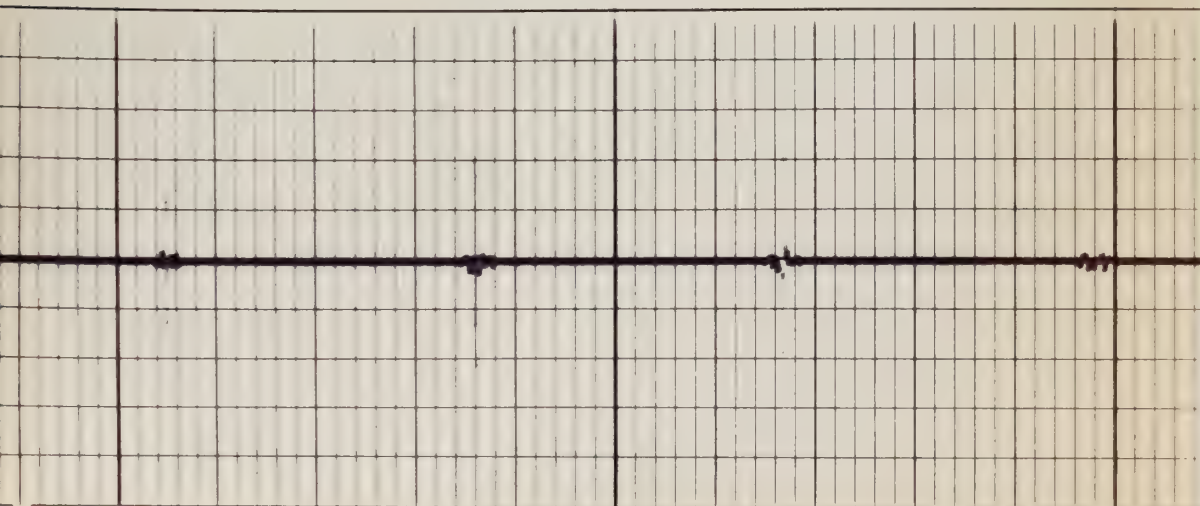
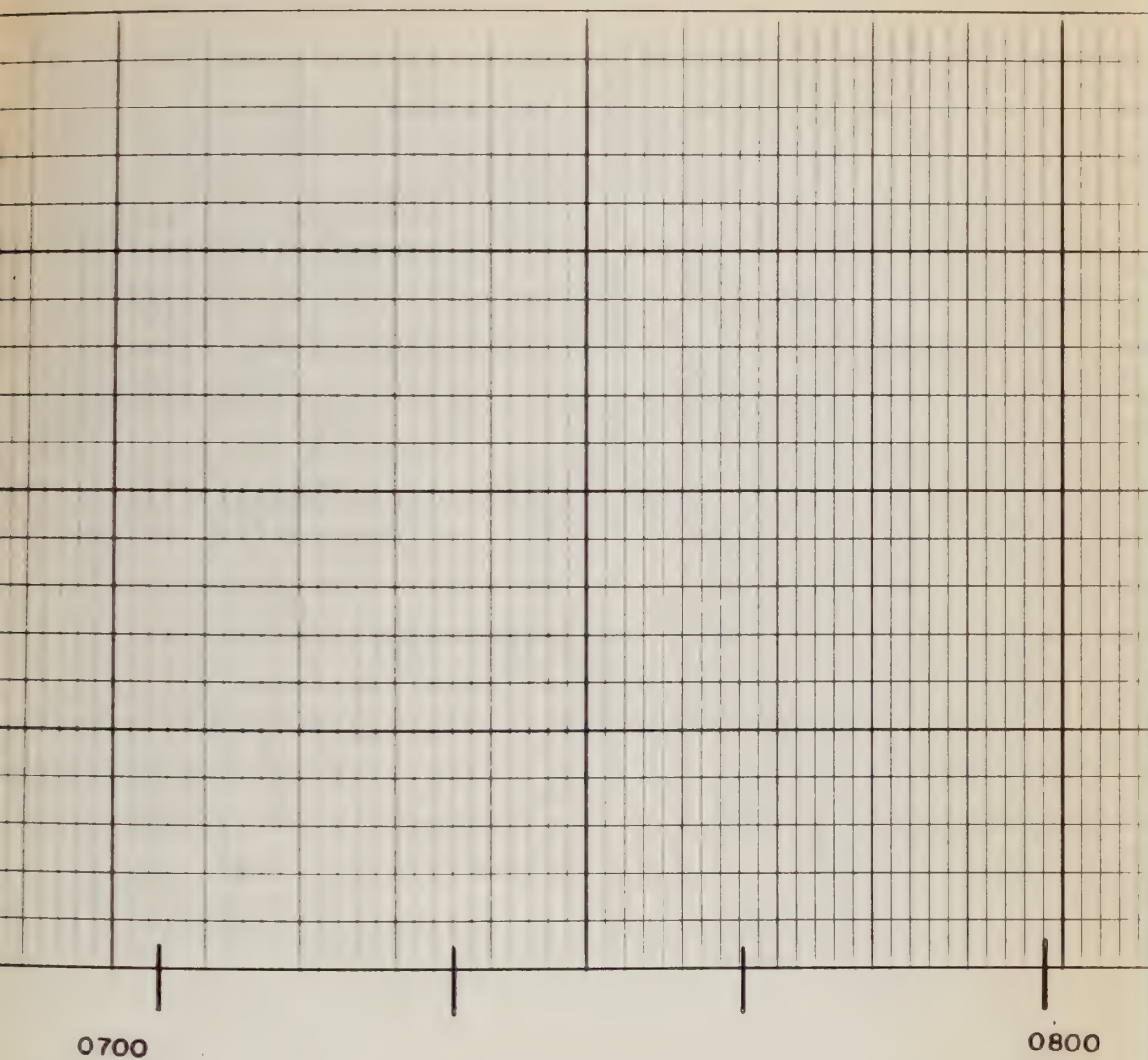
$\frac{1}{2}$ in.

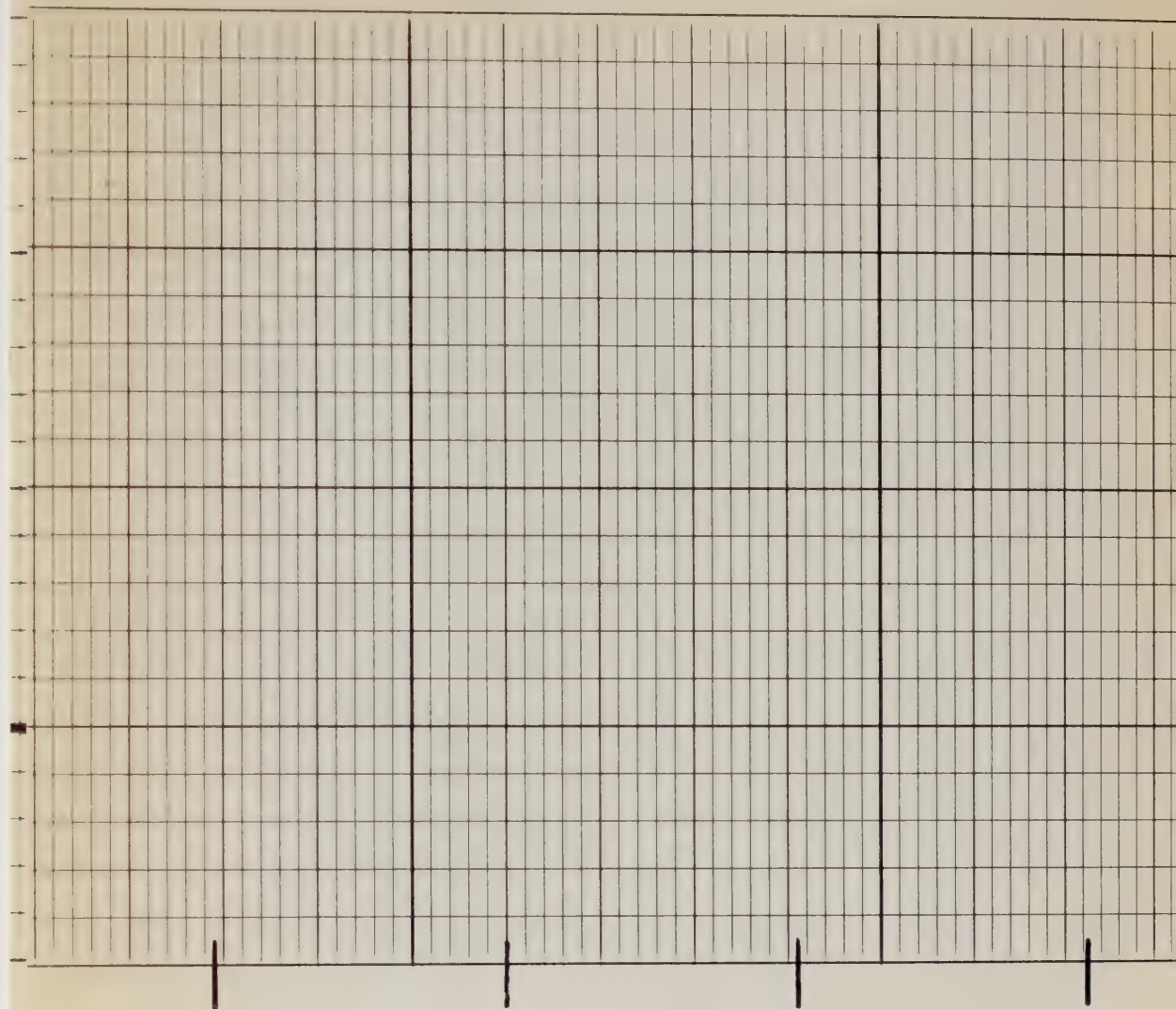


DEPTH

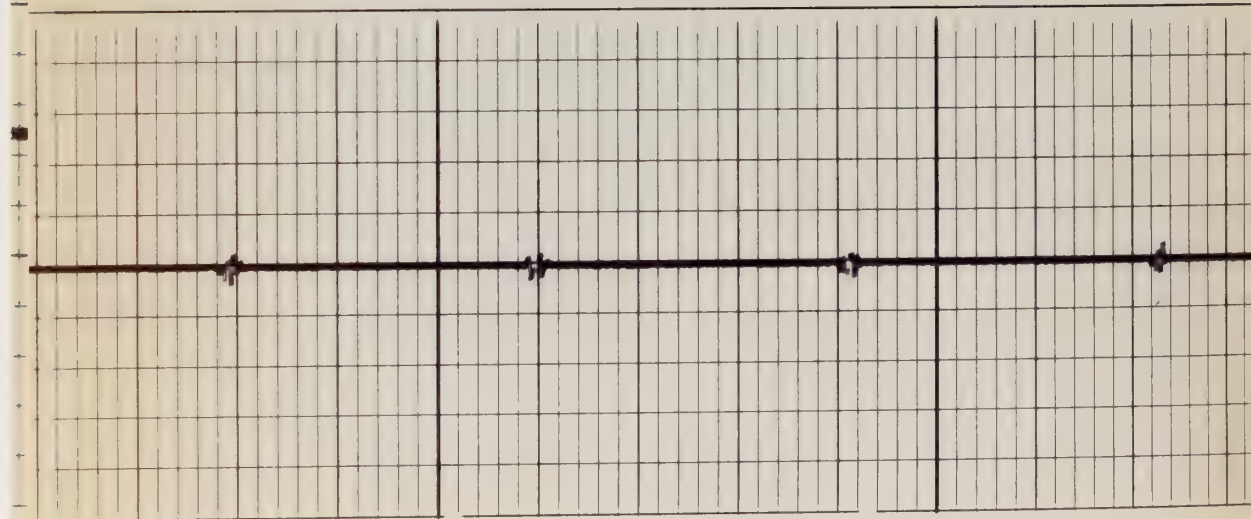
CASING COLLAR LOG
BEFORE PERFORATION

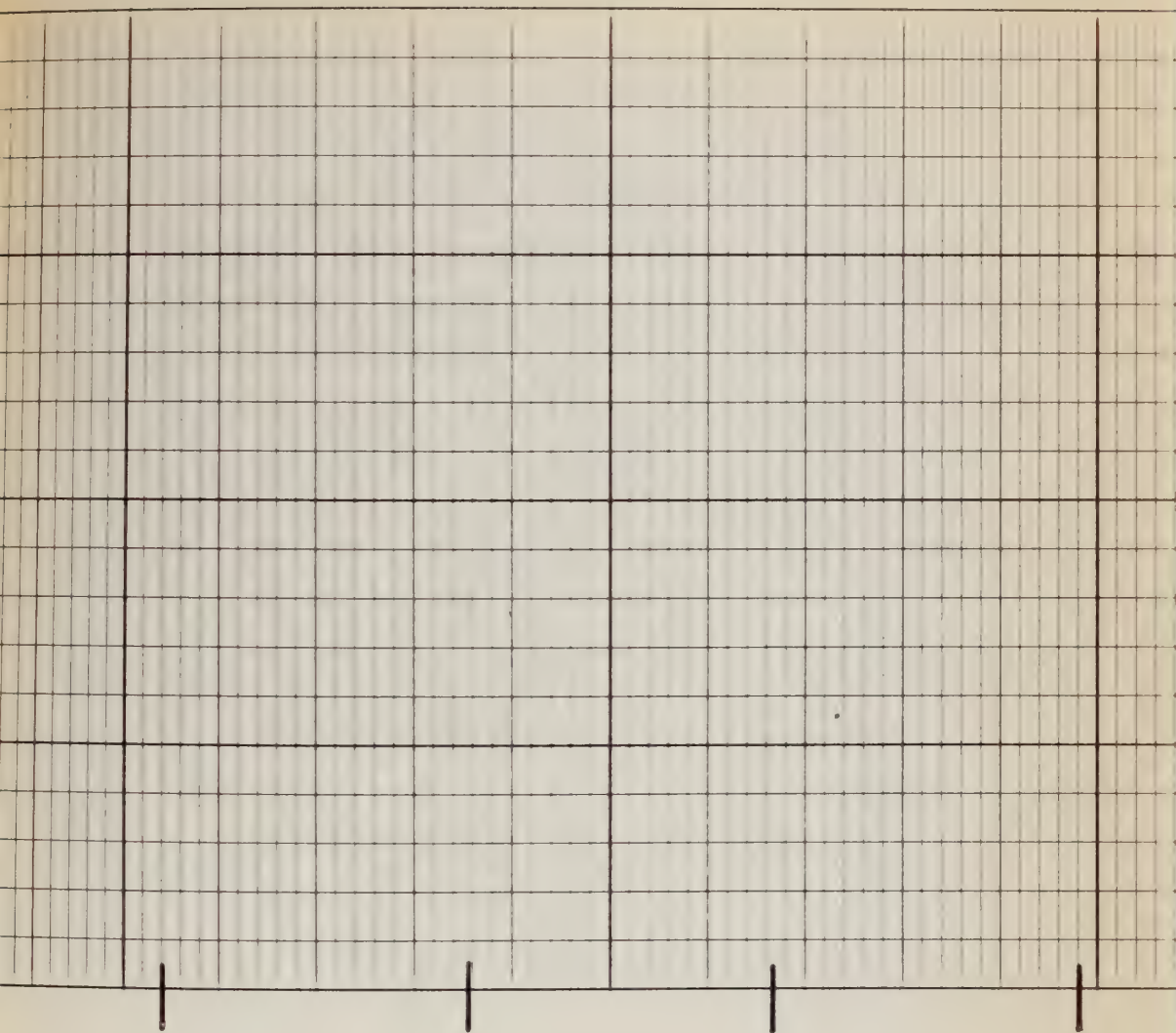
40 1-SHORT STRING



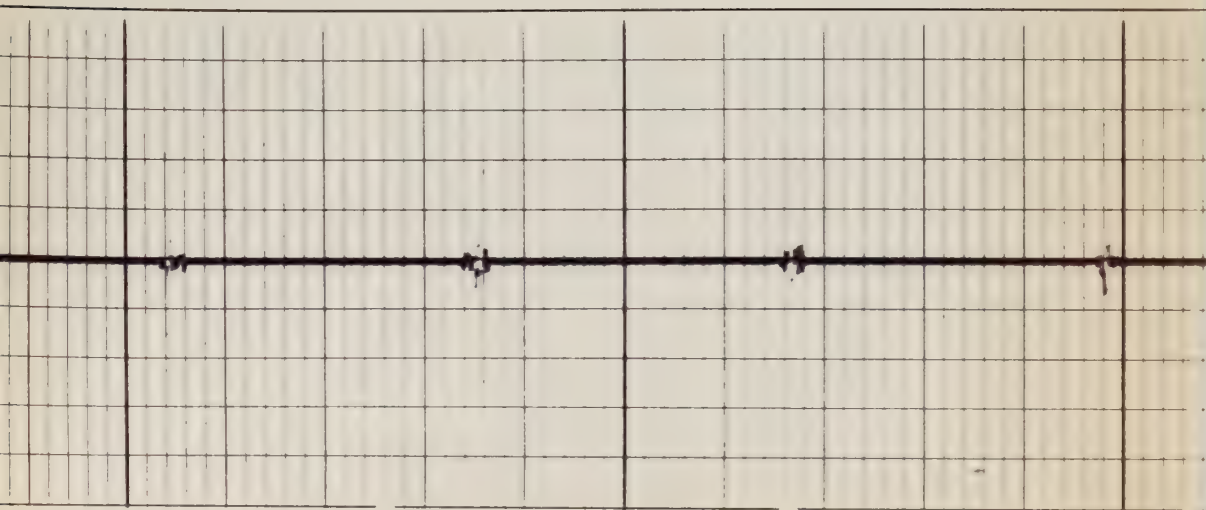


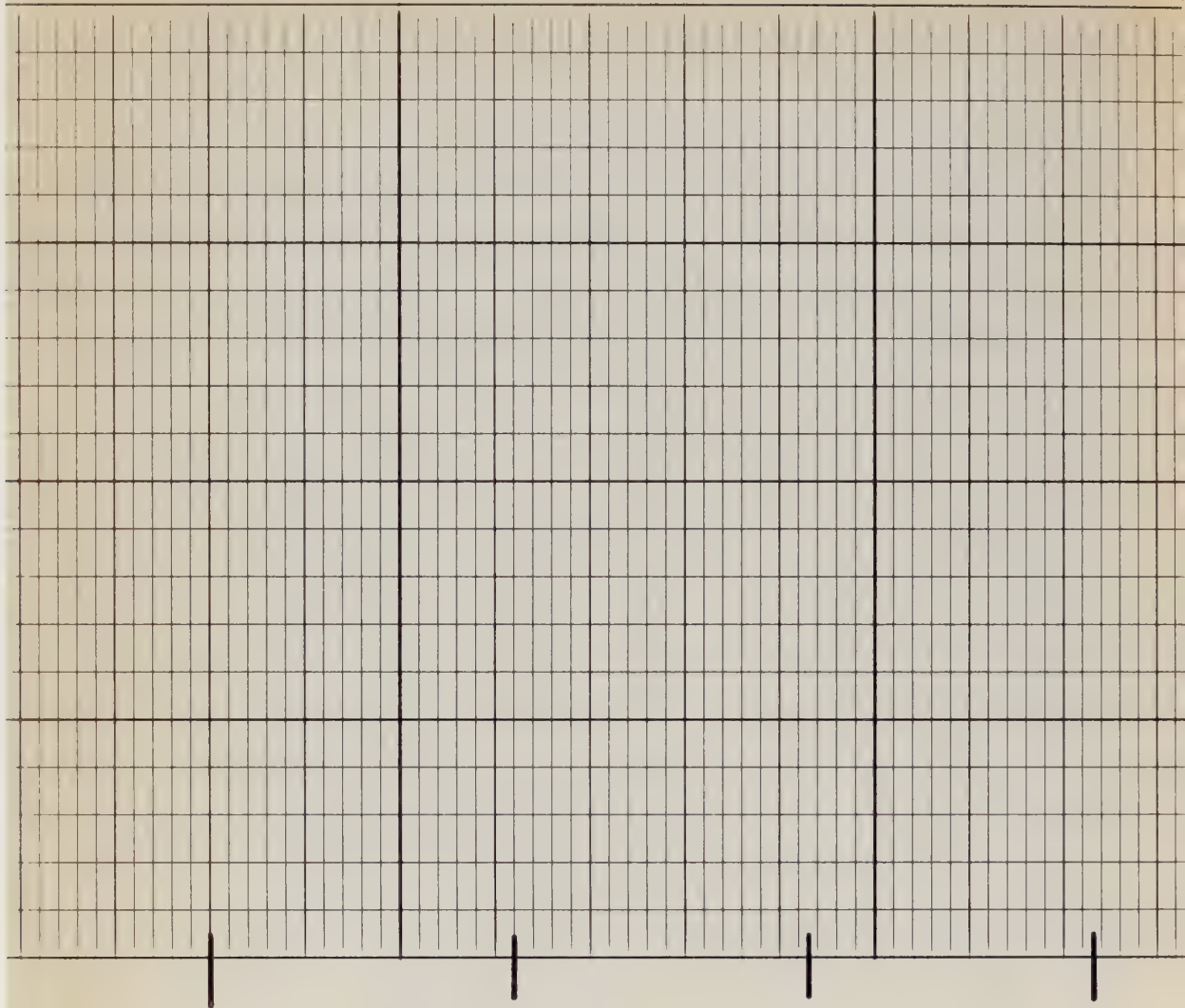
0900



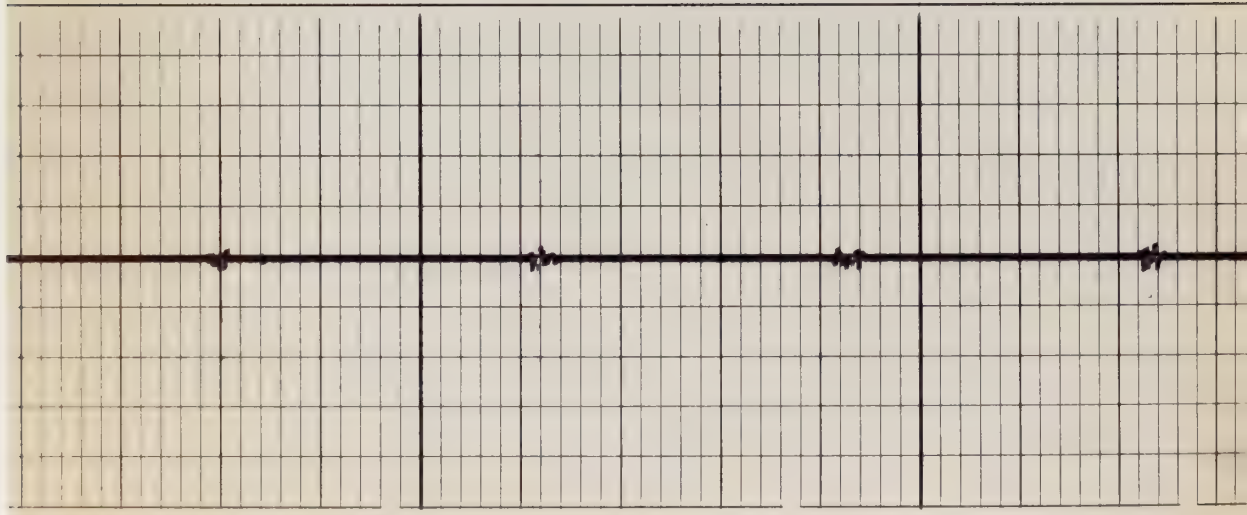


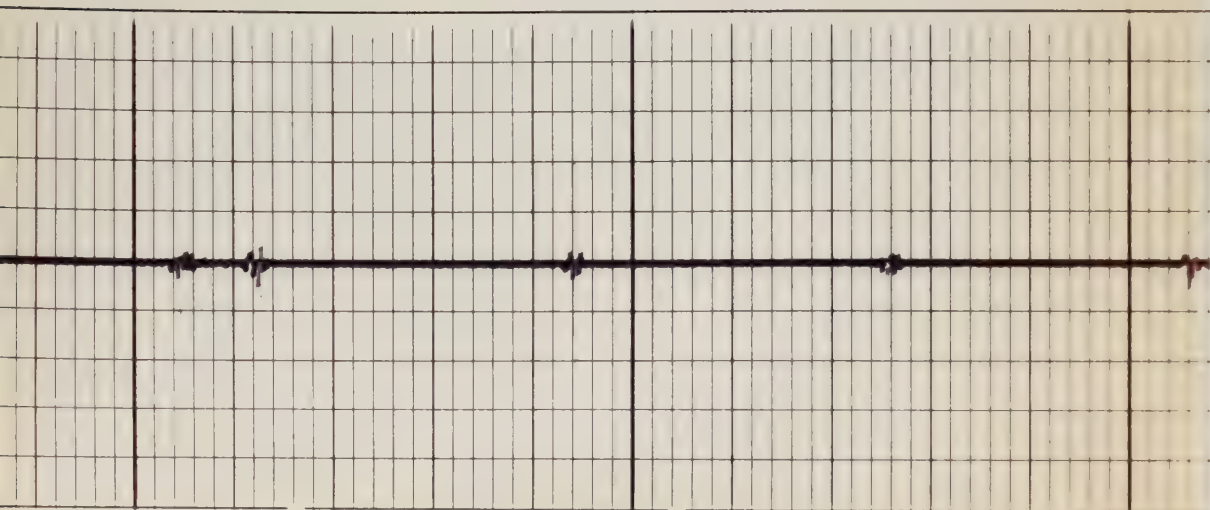
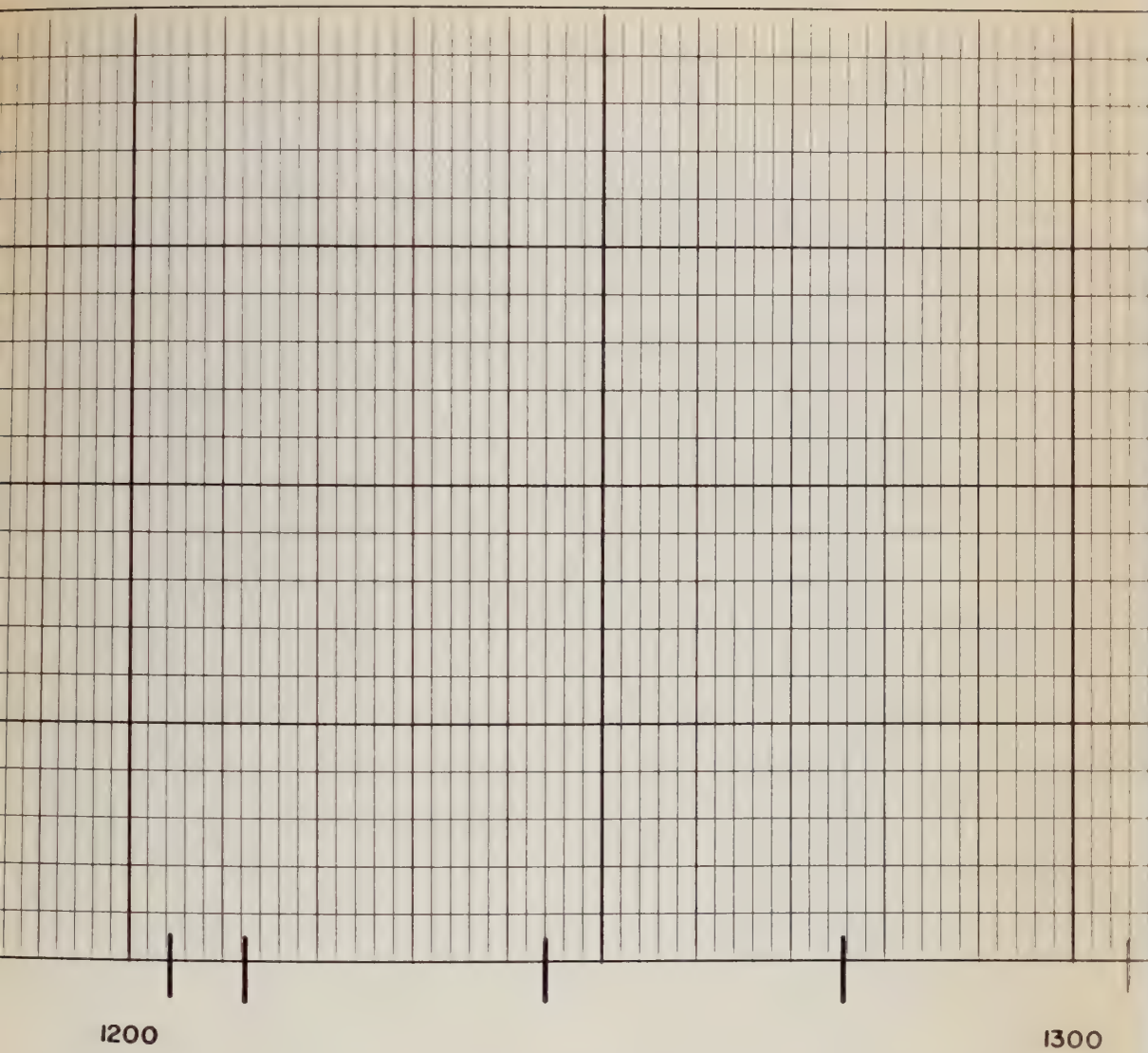
1000

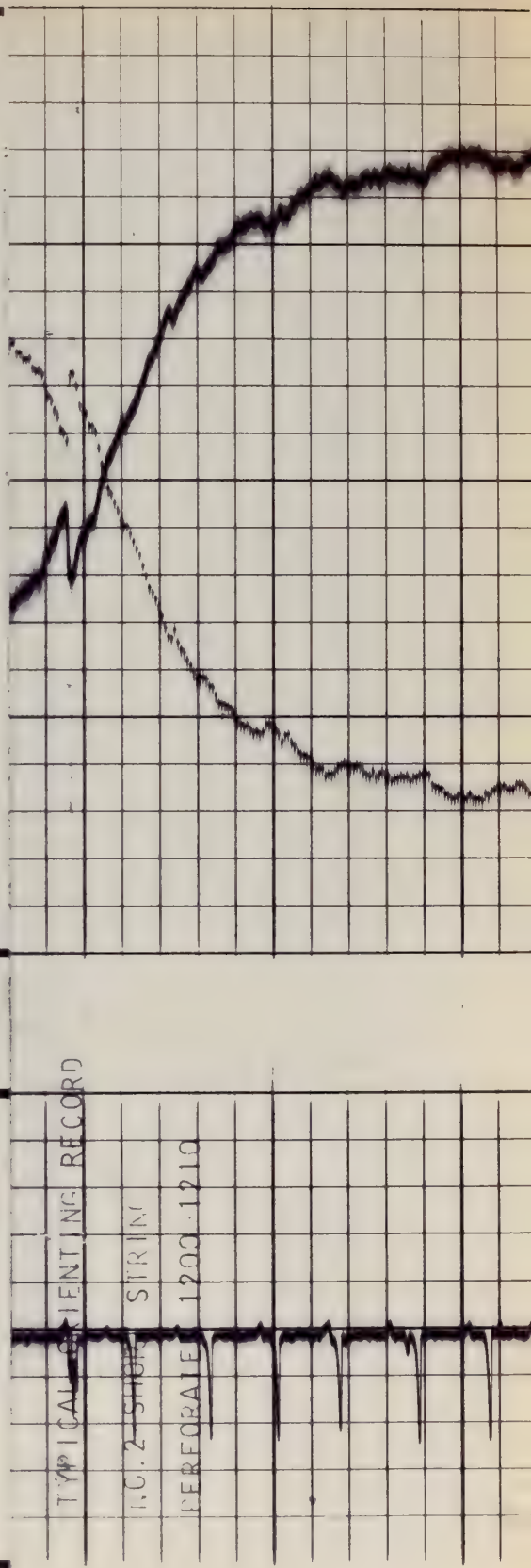
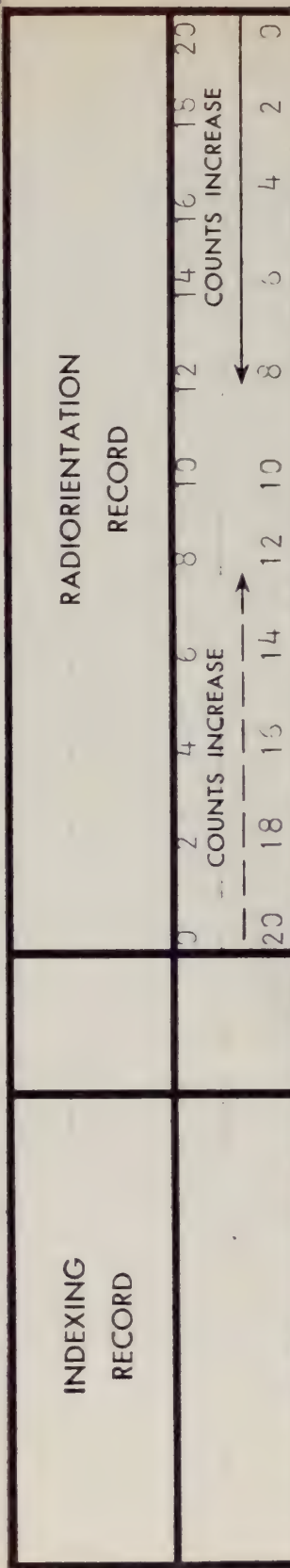


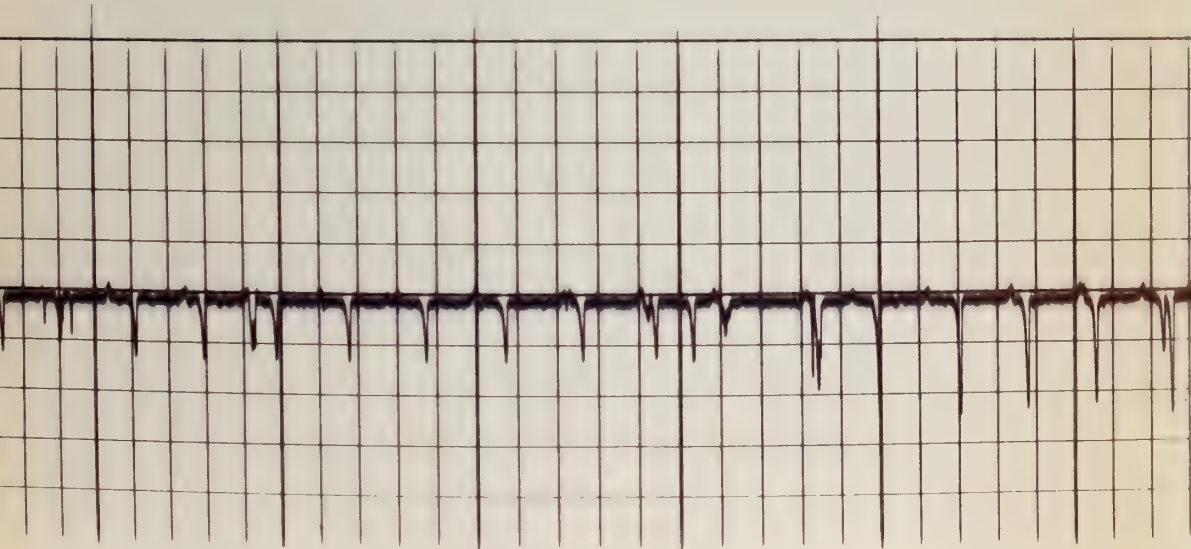
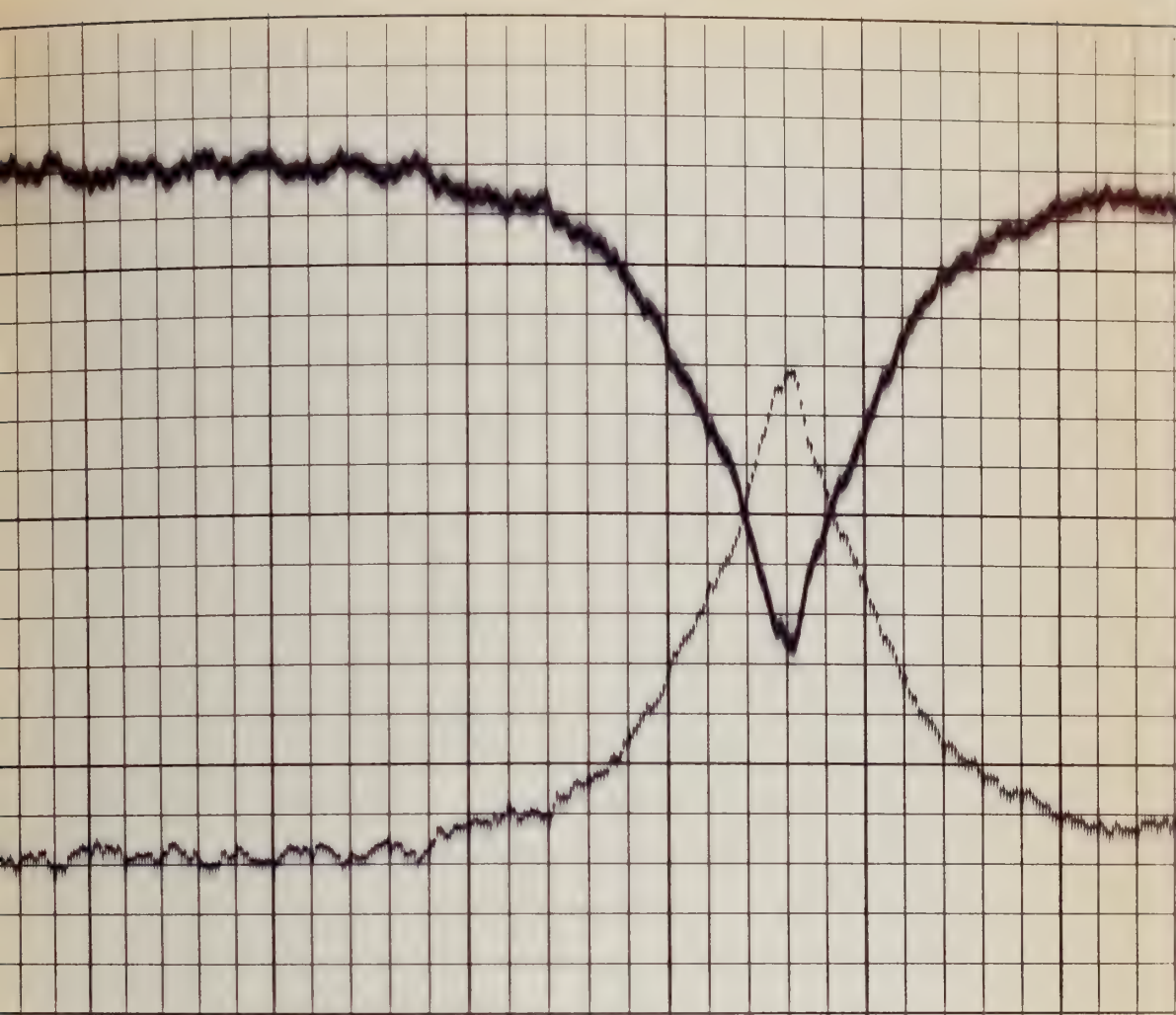


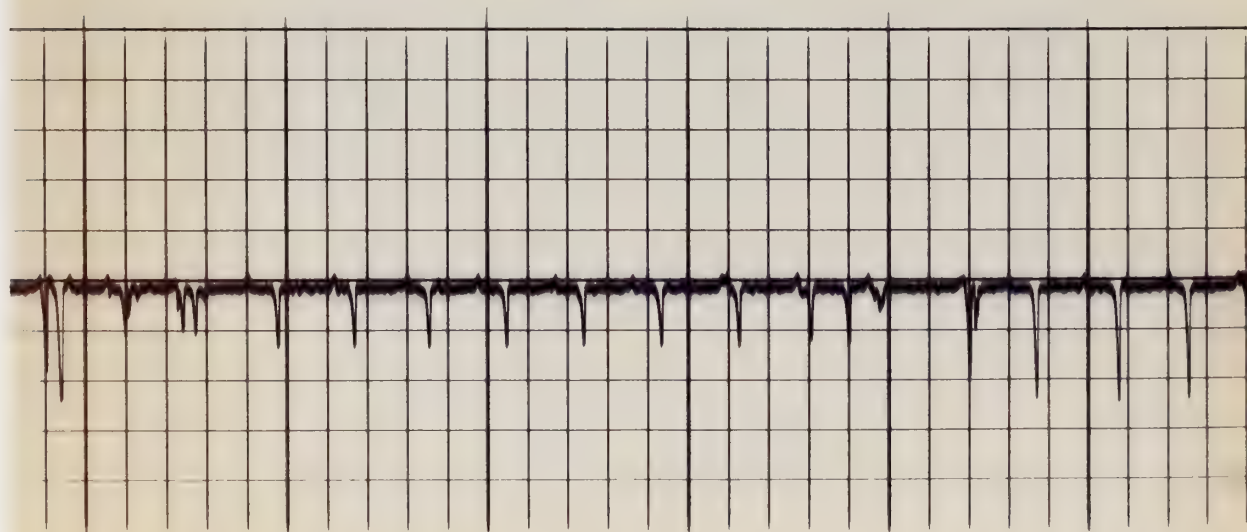
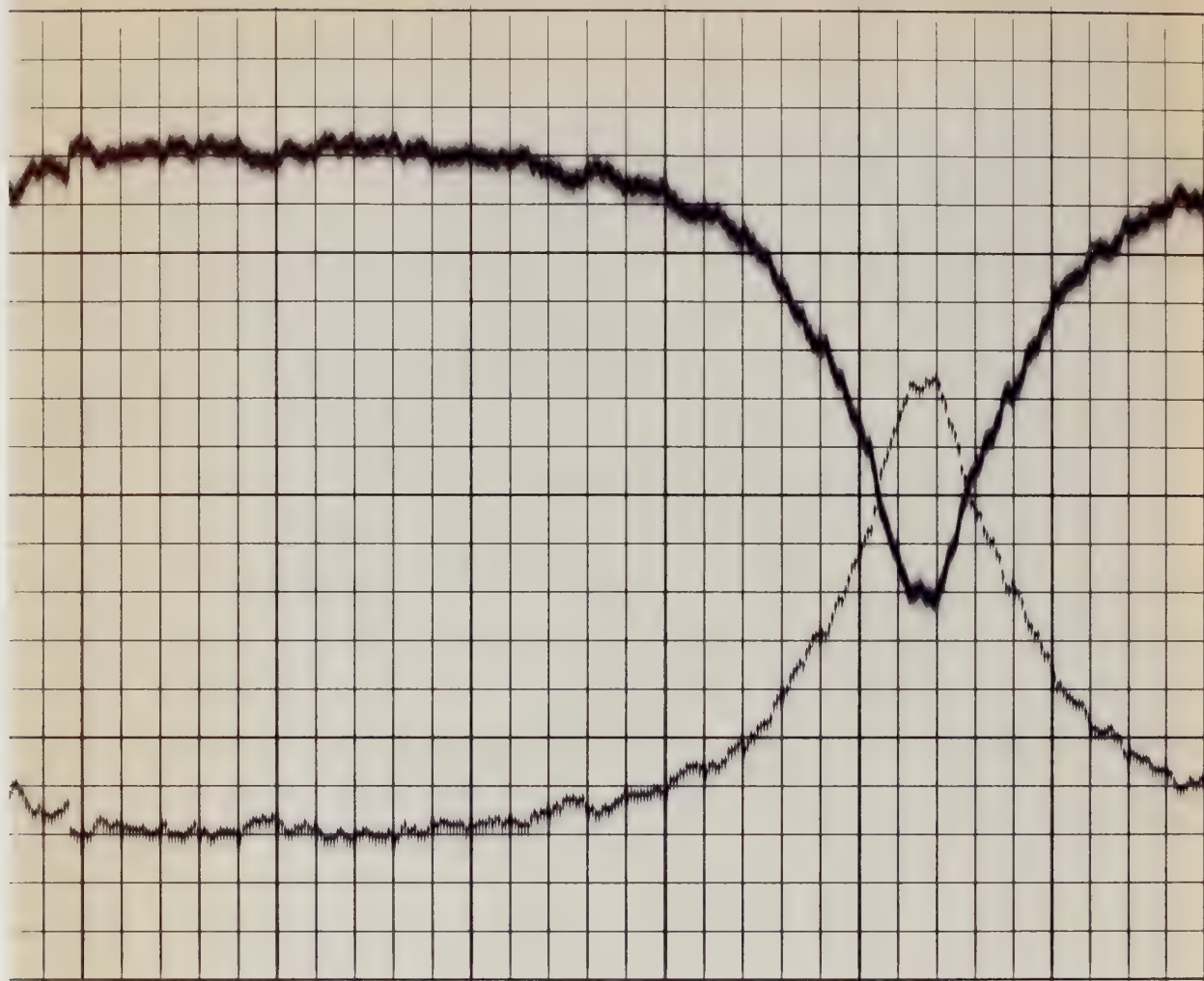
1100

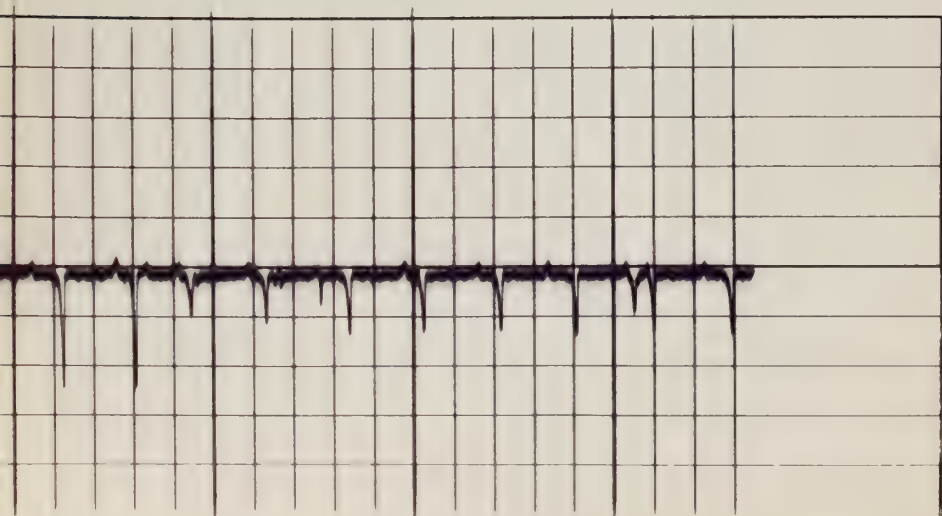
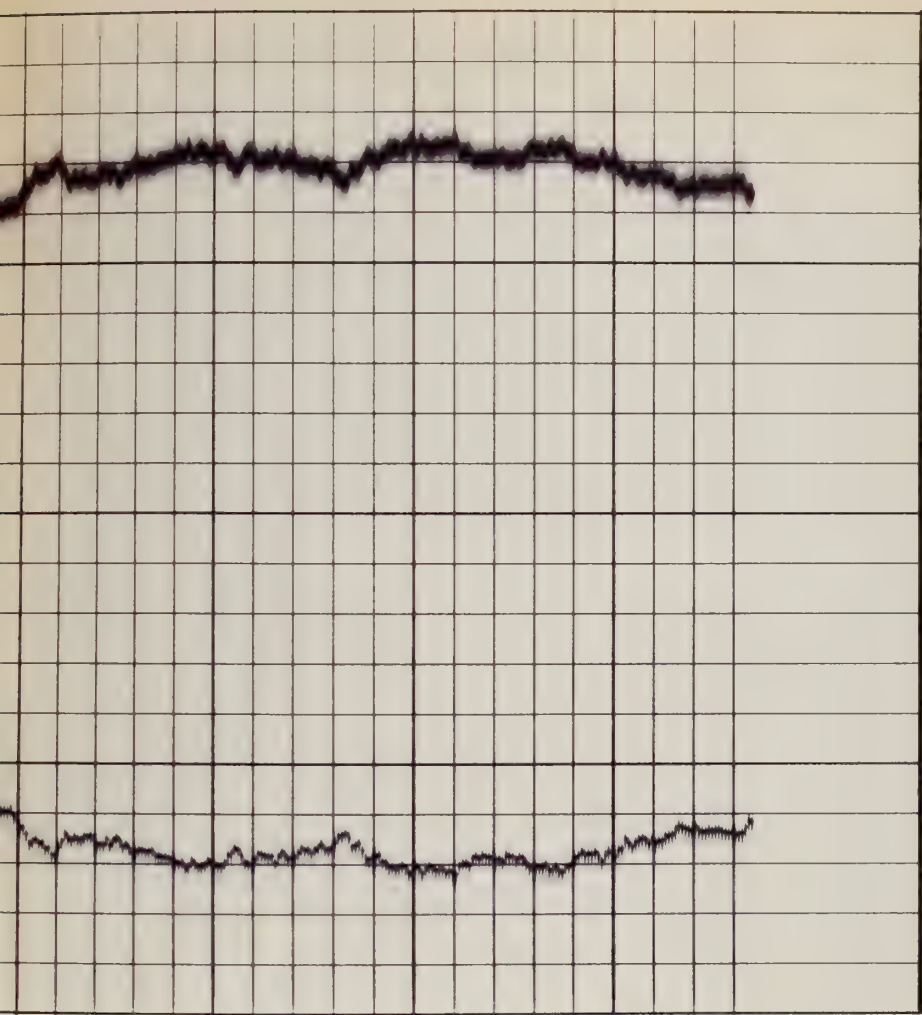








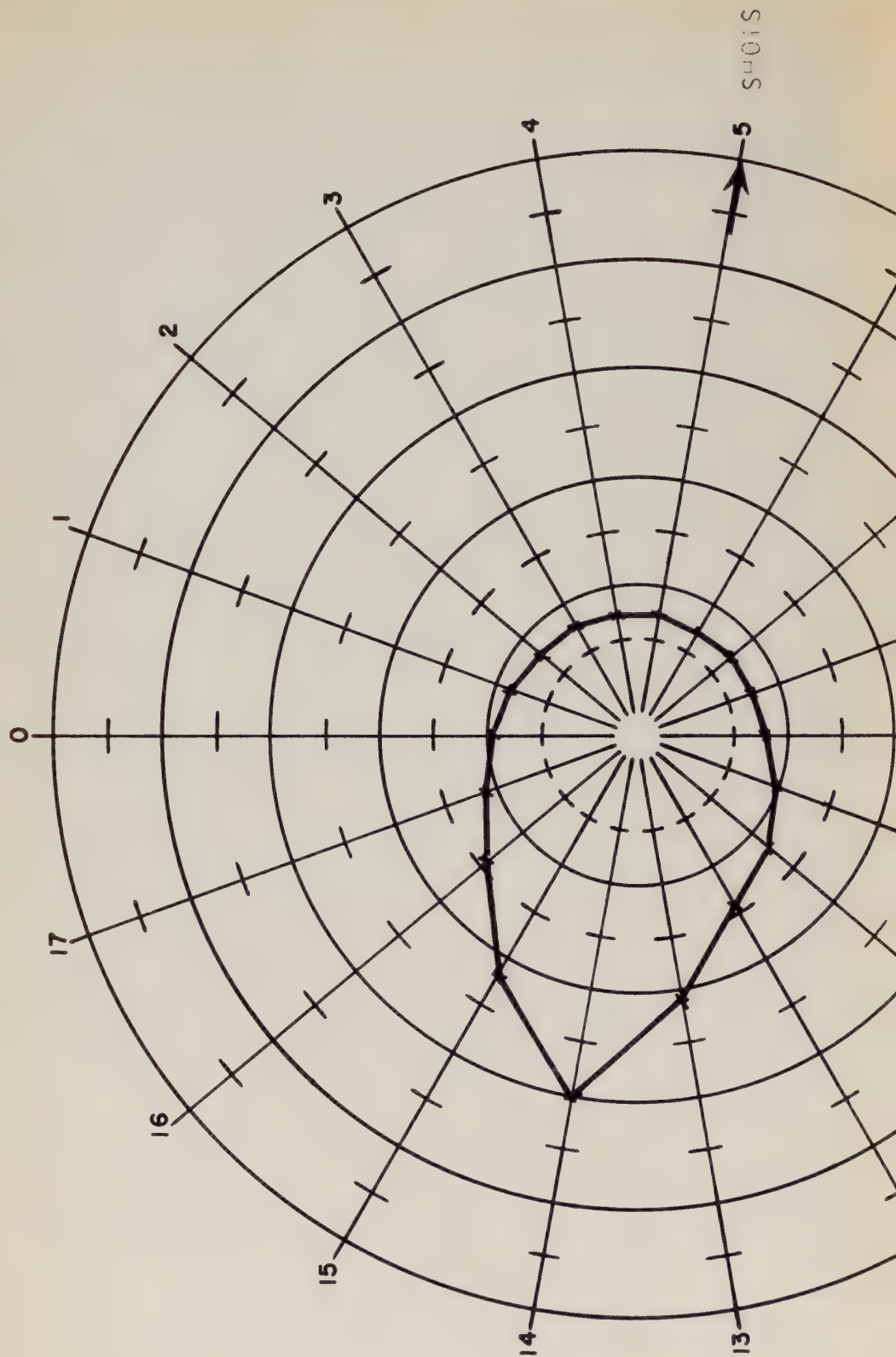


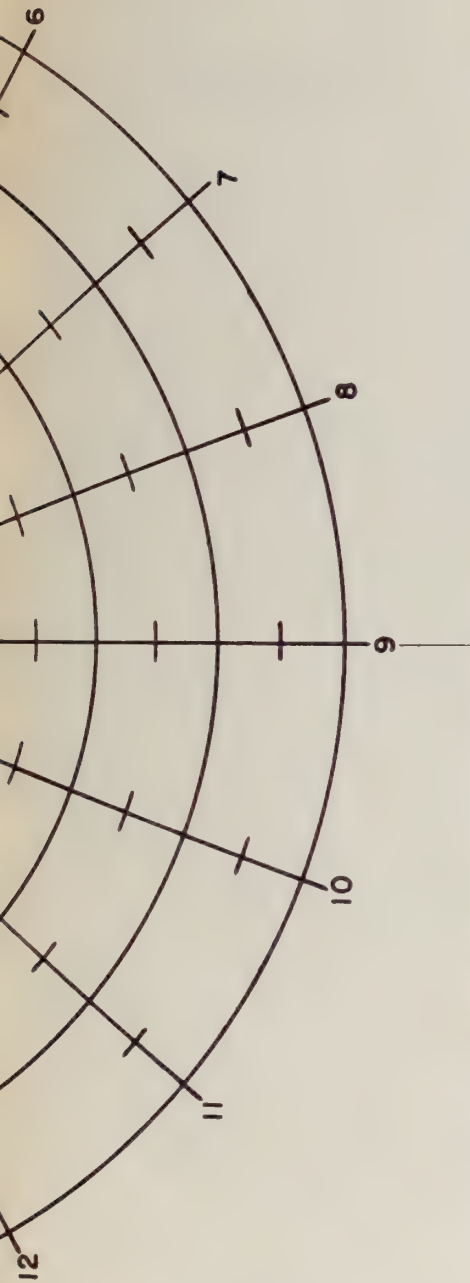


RADIOORIENTATION PLOT

POT-B

NO. 2 SCOT STRING PERFORATED 1200-1210 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





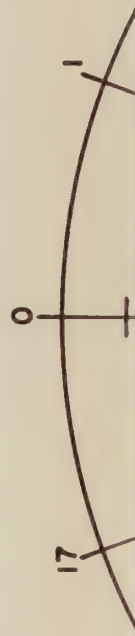
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

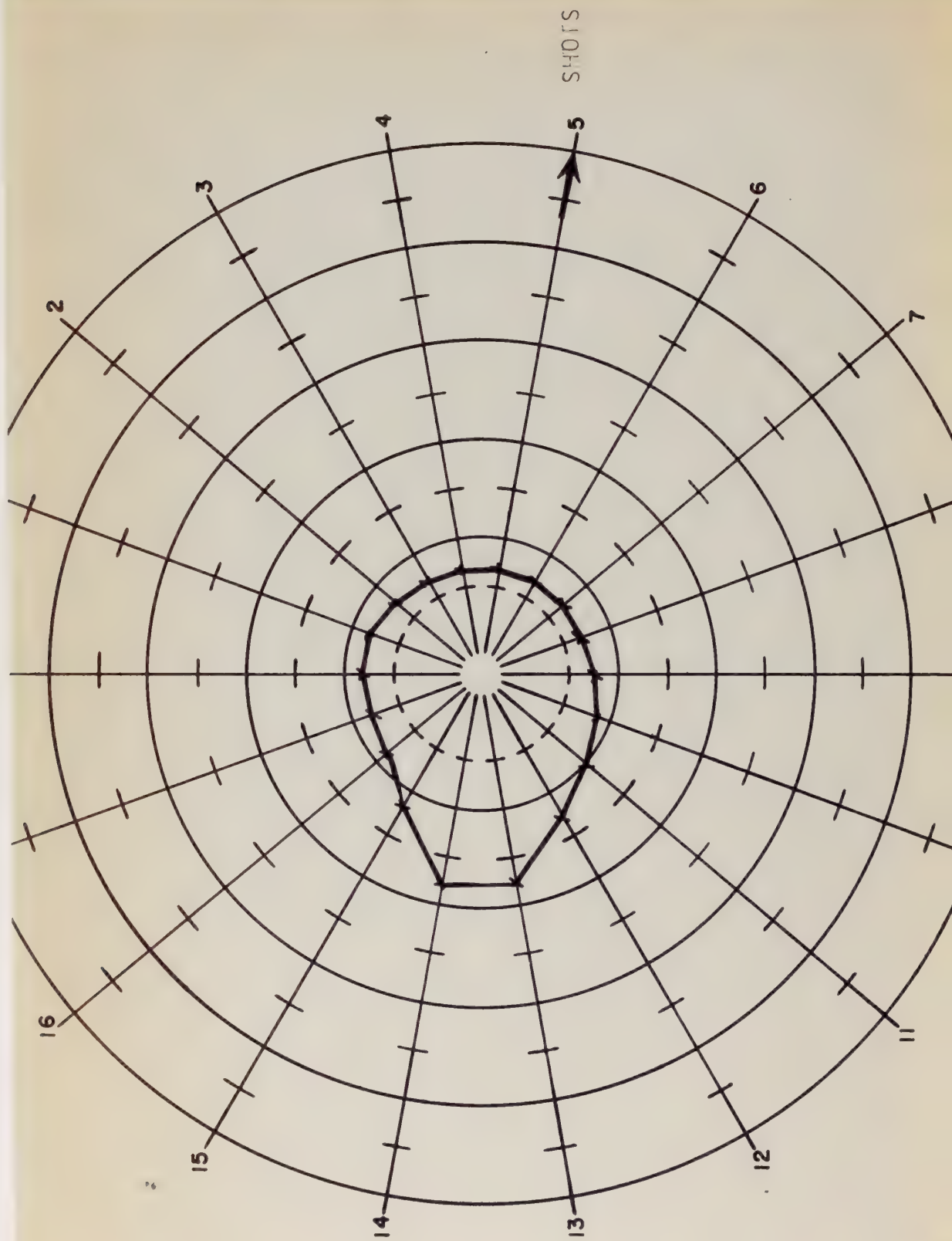
Schlumberger

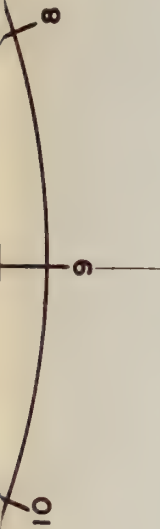
RADIOORIENTATION PLOT

POT-B

0.2 SHOT STRIM. PERFORATED 1189-1199 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME







This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

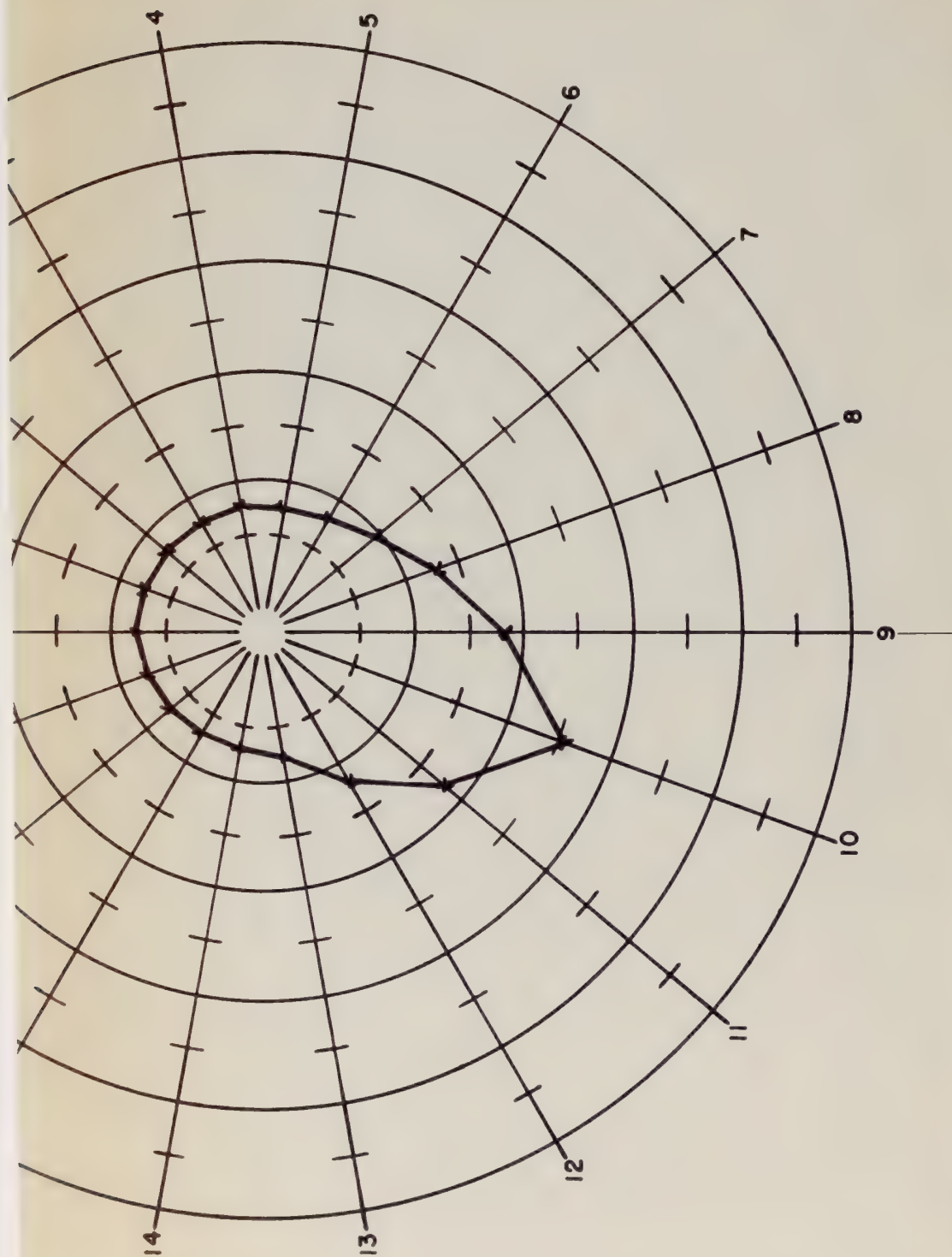
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

LOG 2 SHORT STRING PERFORATED 1178-1188 ONE SHOP PER FOOT WITH 1 11/16" HYPERDOME



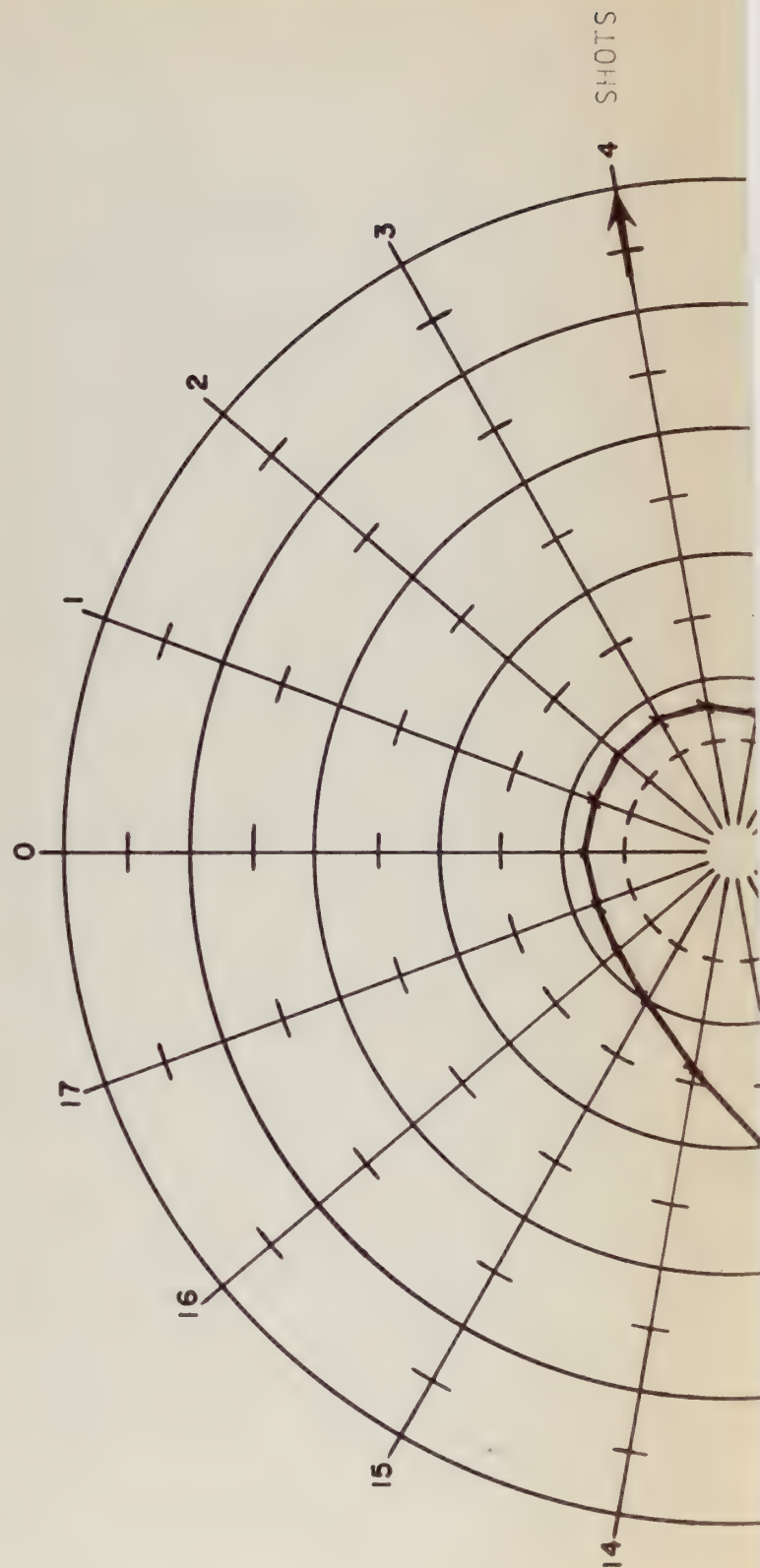


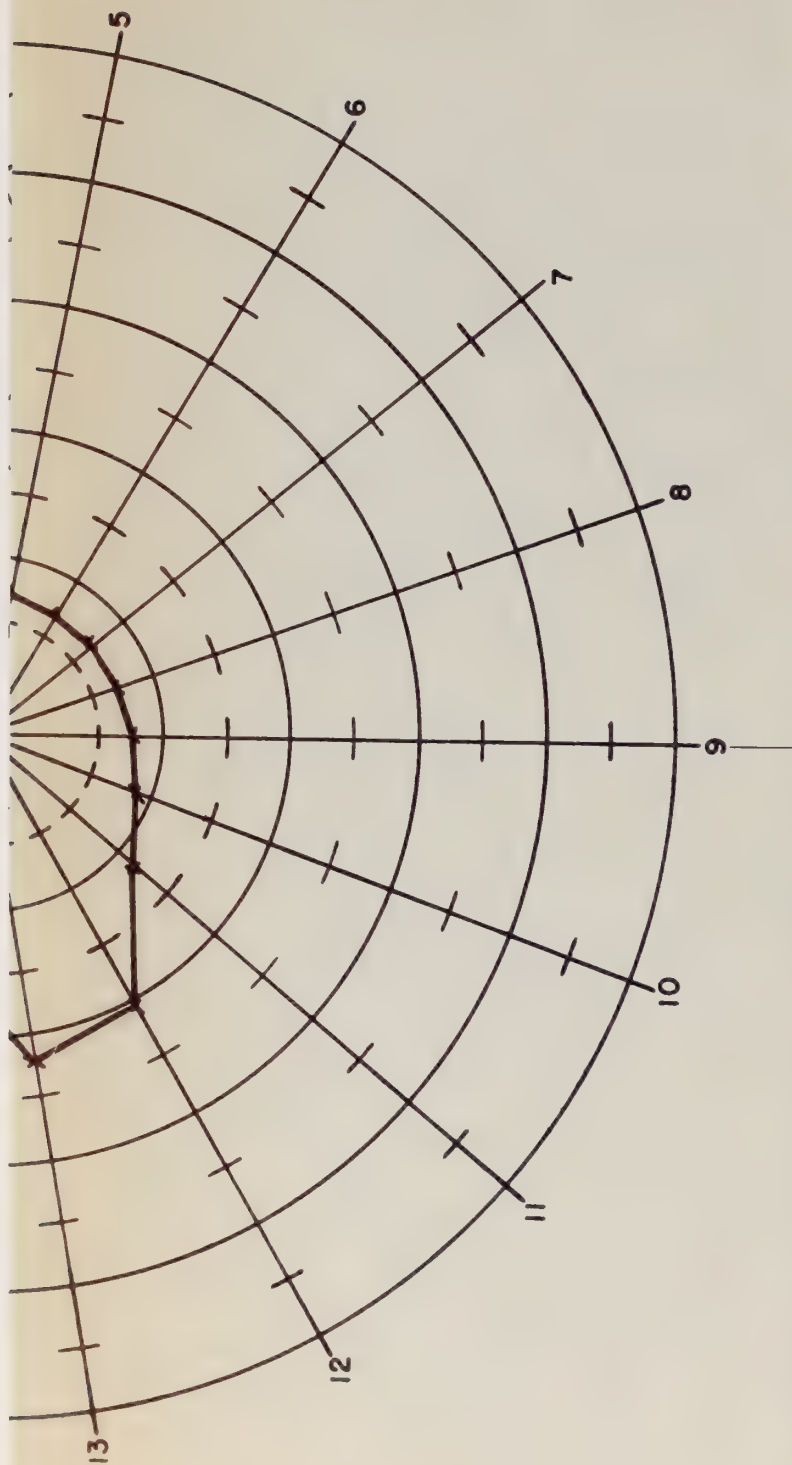
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIORIENTATION PLOT

POT-B

0.2 SEC STRIP PERFORATED 1170 1177 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



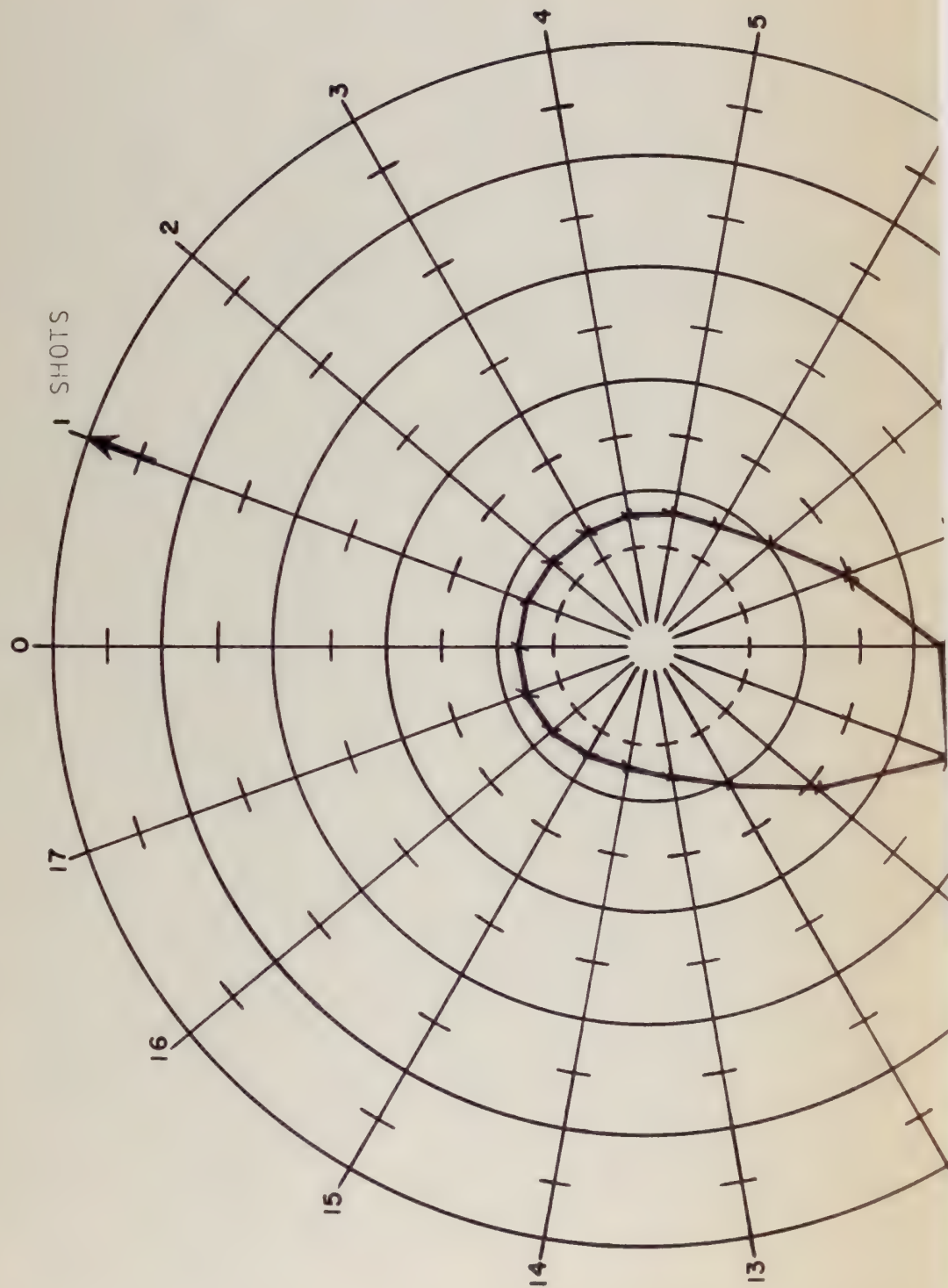


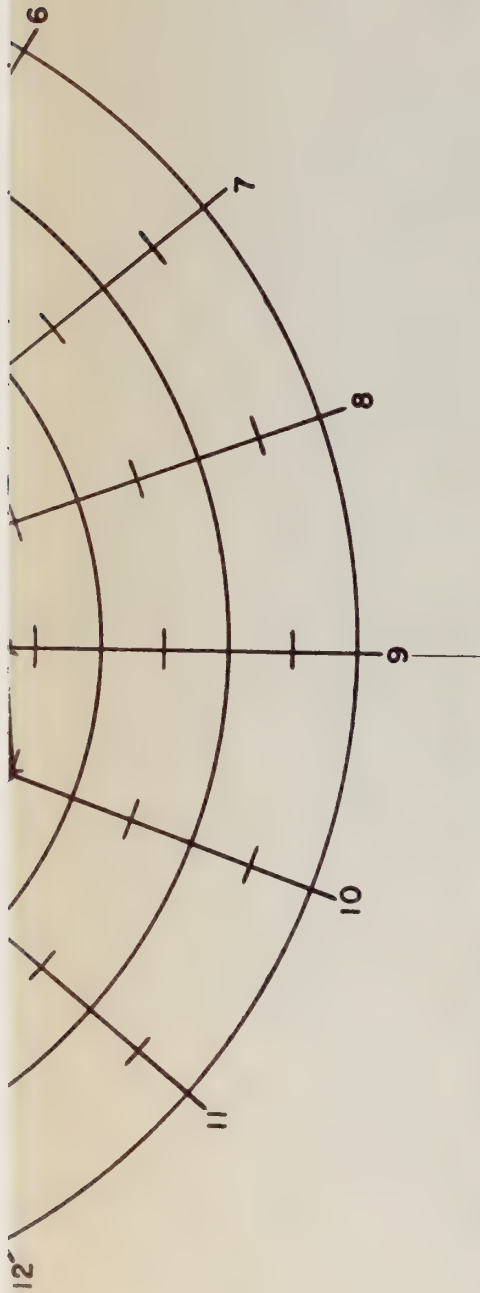
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIORIENTATION PLOT

POT-B

0.2 SHOT STRING PERFORATED 1142-1152 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





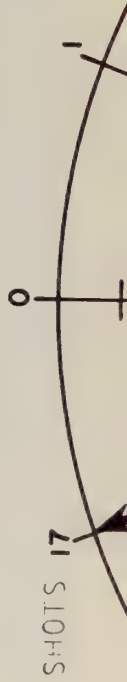
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

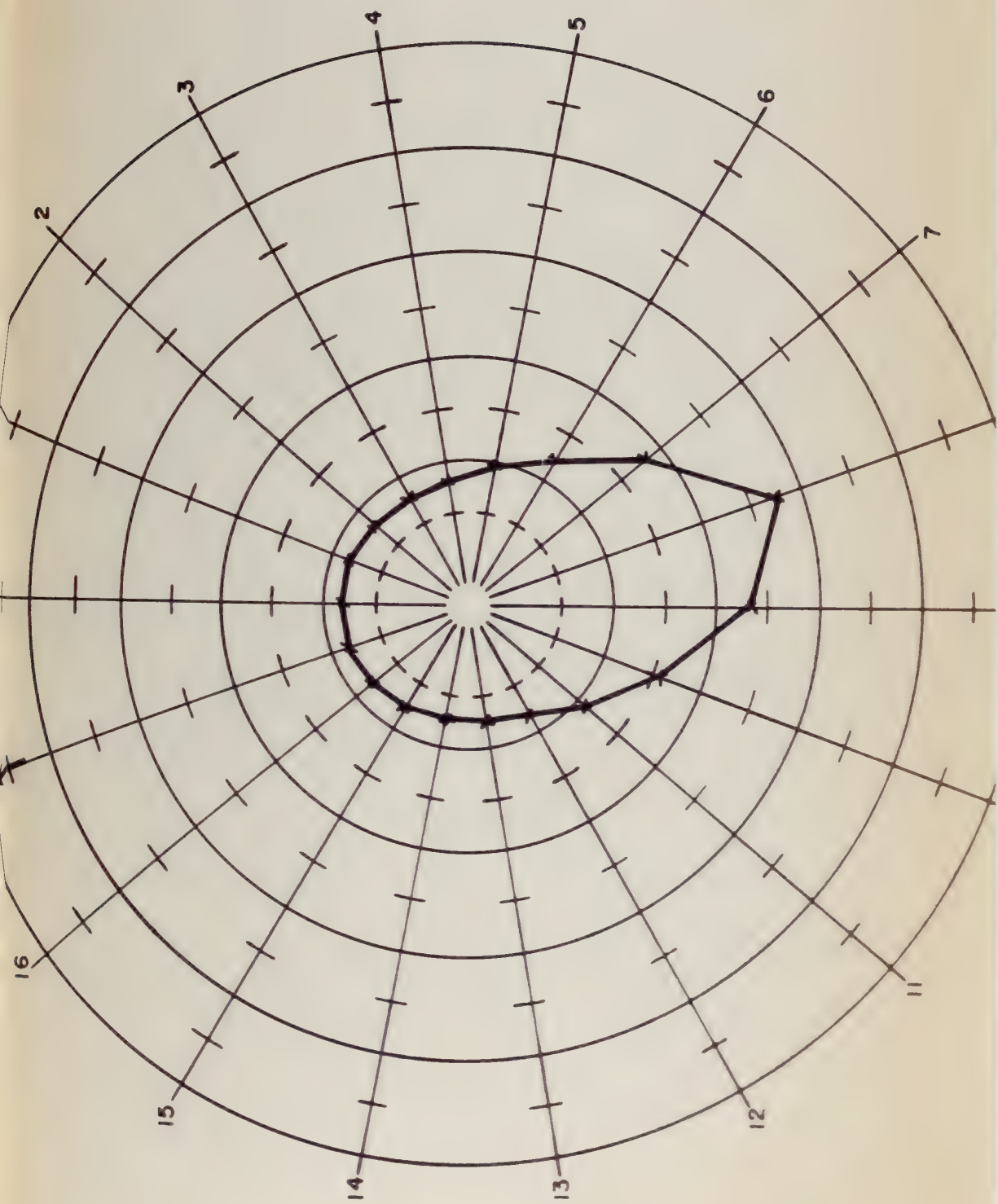
RADIOORIENTATION PLOT

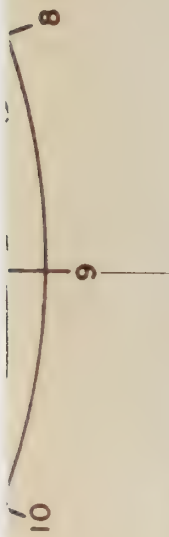
POT-B

LOG 2 SHOT STAIN PERFORATED 1132-1141 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



SHOTS 17





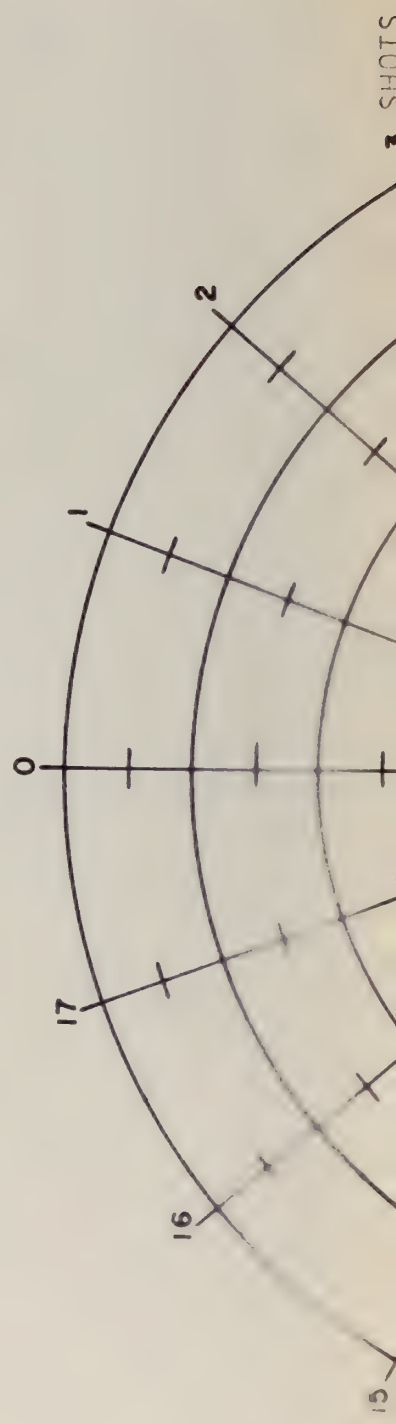
This chart, compilation and interpretation of our readings from our gamma camera orientation and de-
 tecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
 as now set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
 side of our Service Order for this job. The readings could be adversely affected by variant metal in the
 drill hole and other conditions unknown to us.

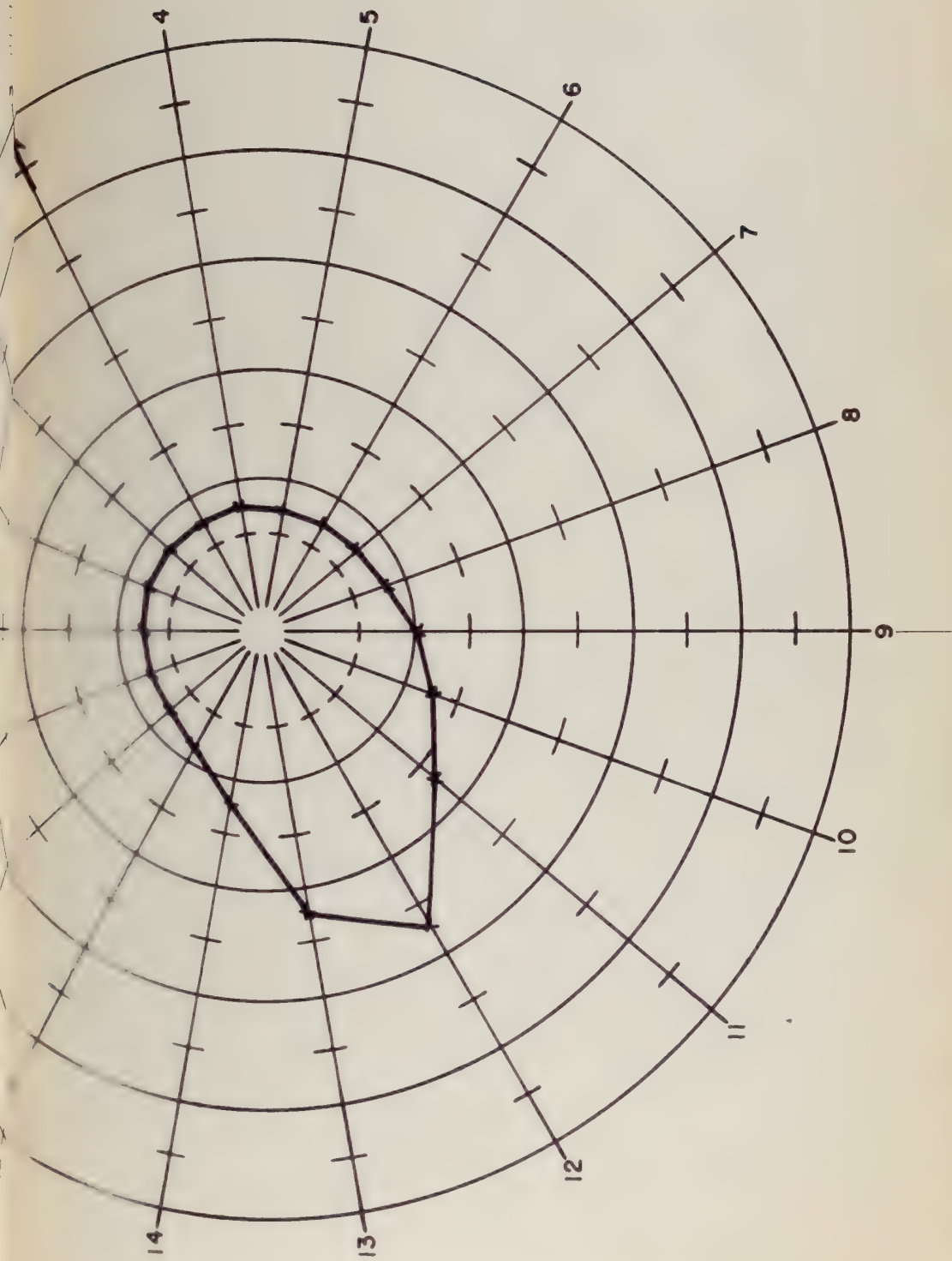
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

10.2 SINOPEL SINOPEL PERFORATED 1122-1131 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





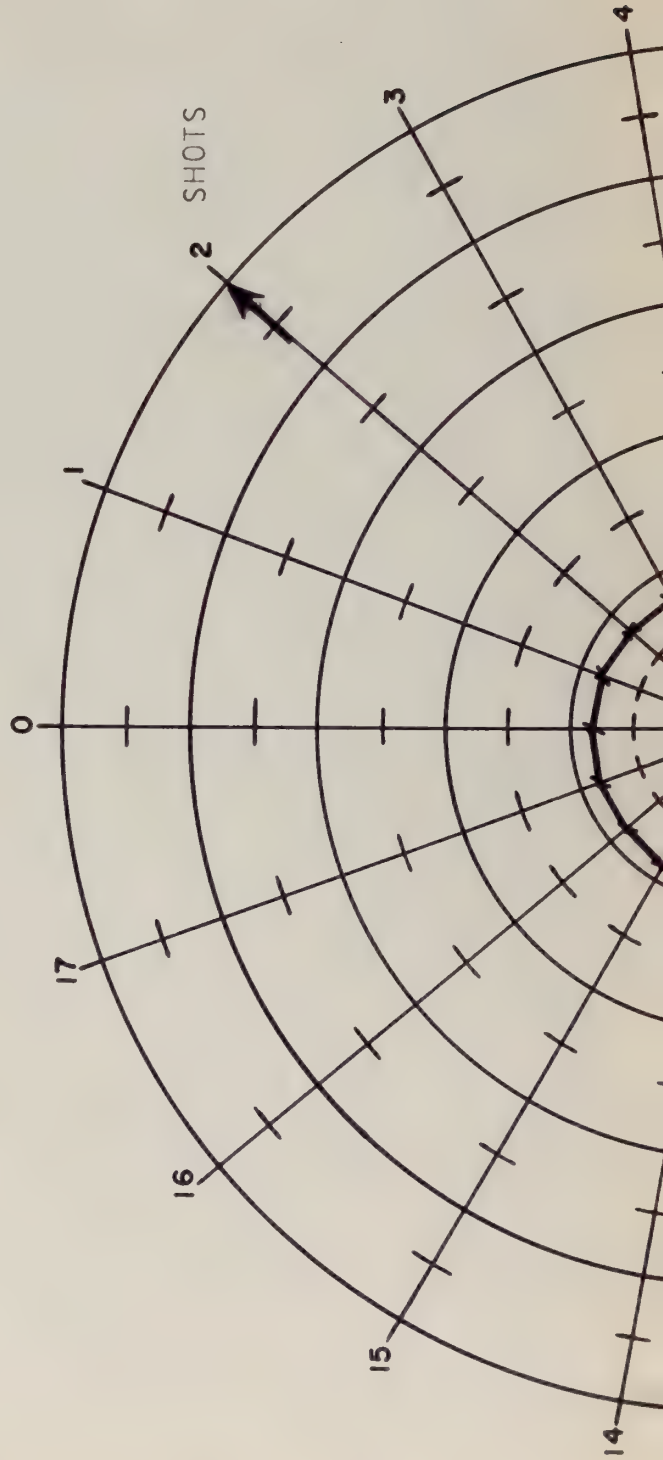
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by variant metal in the

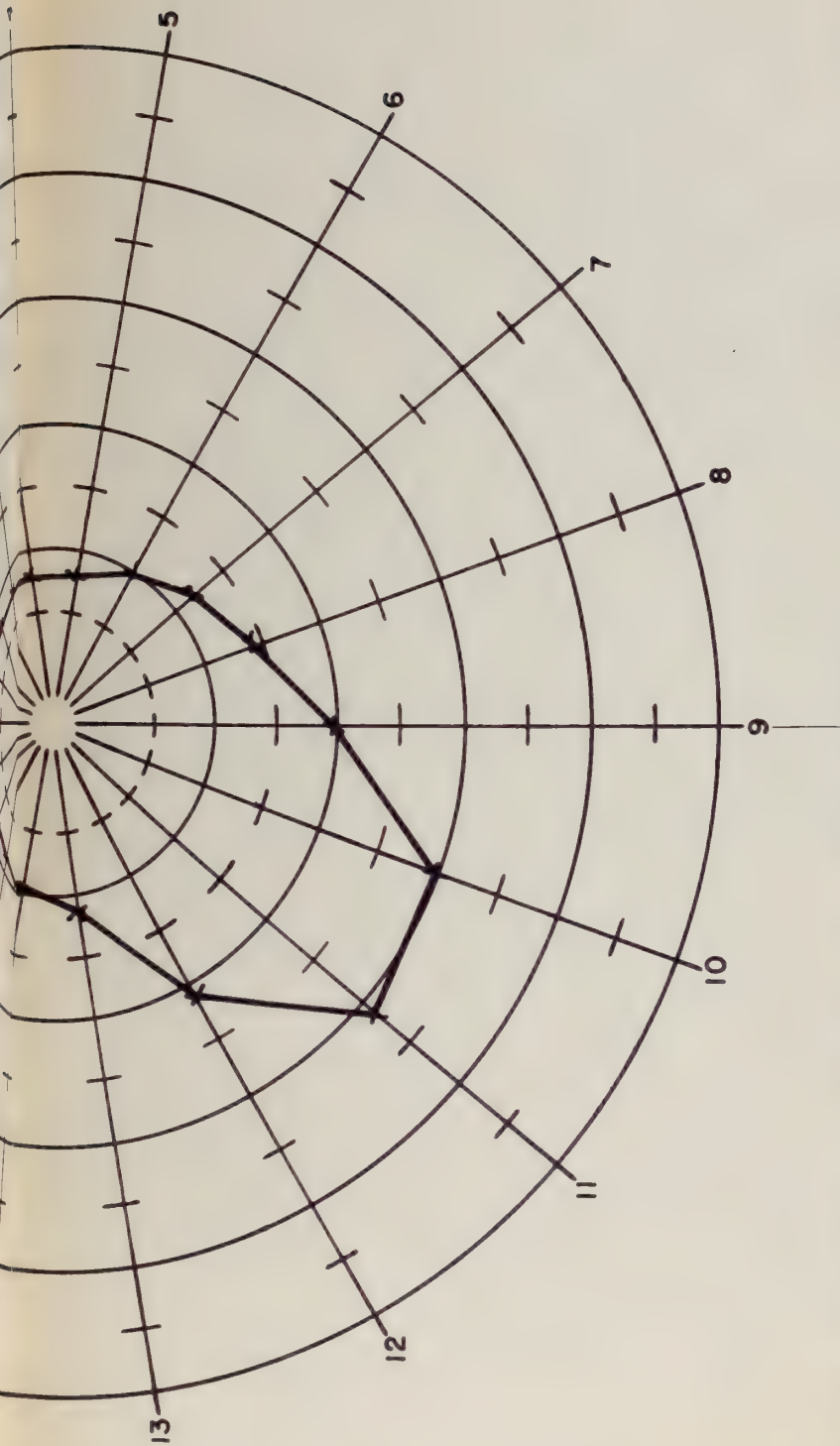
Schlumberger

RADIOORIENTATION PLOT

POT-B

1073-1080 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





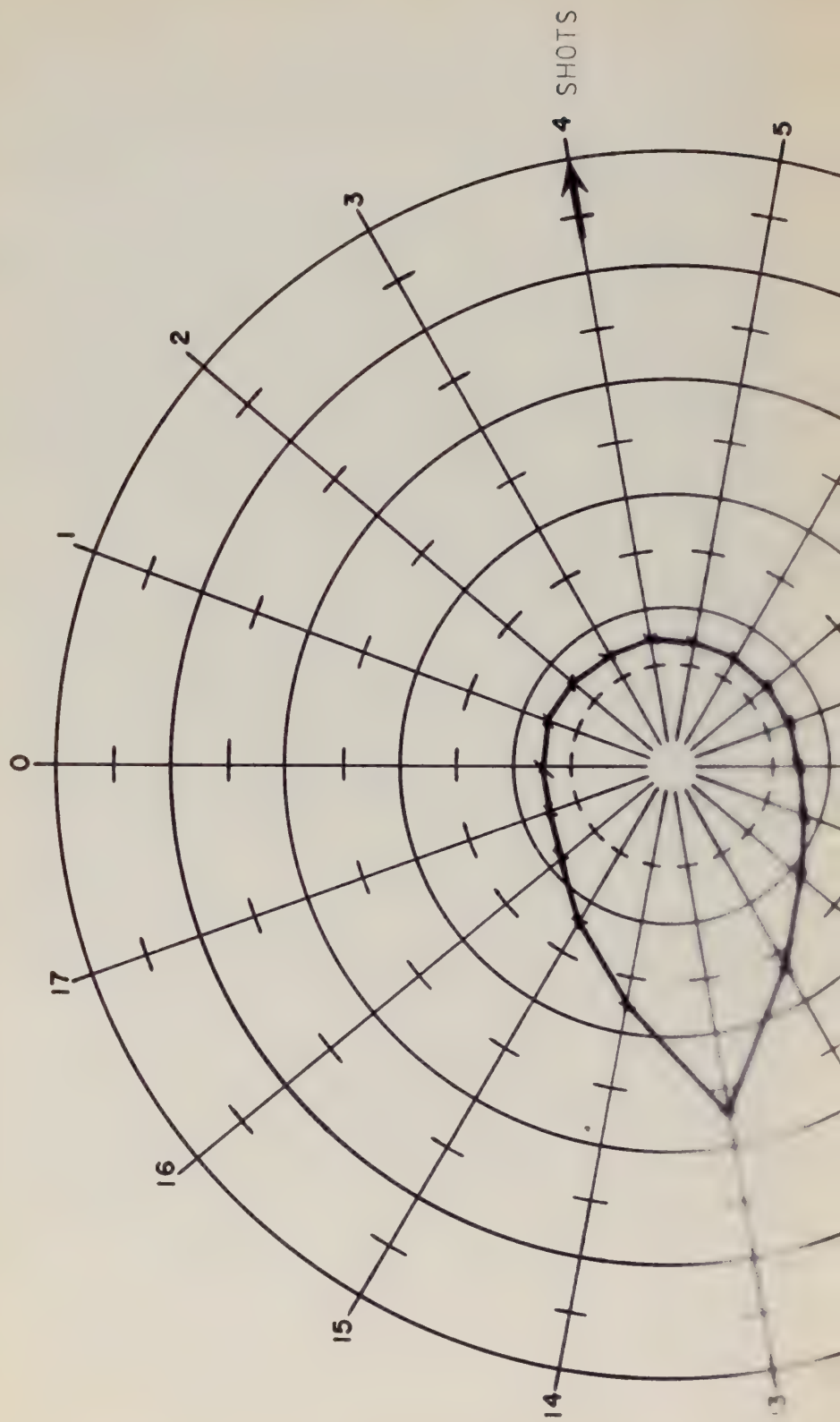
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

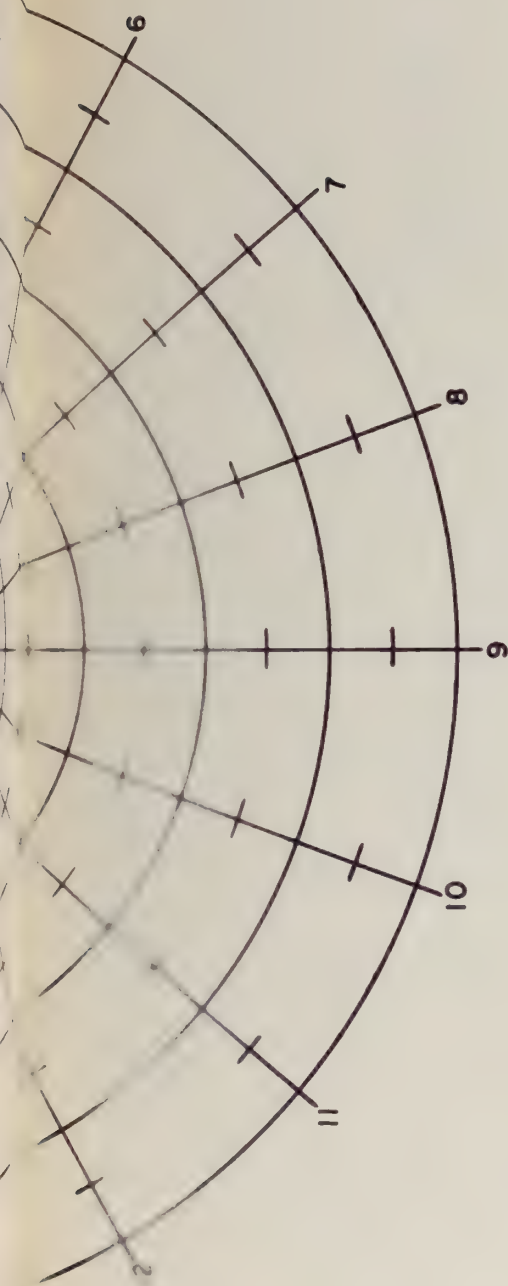
Schlumberger

RADIOORIENTATION PLOT

POT-B

C.2 SHOT STRING PERFORATED 1062-1069 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



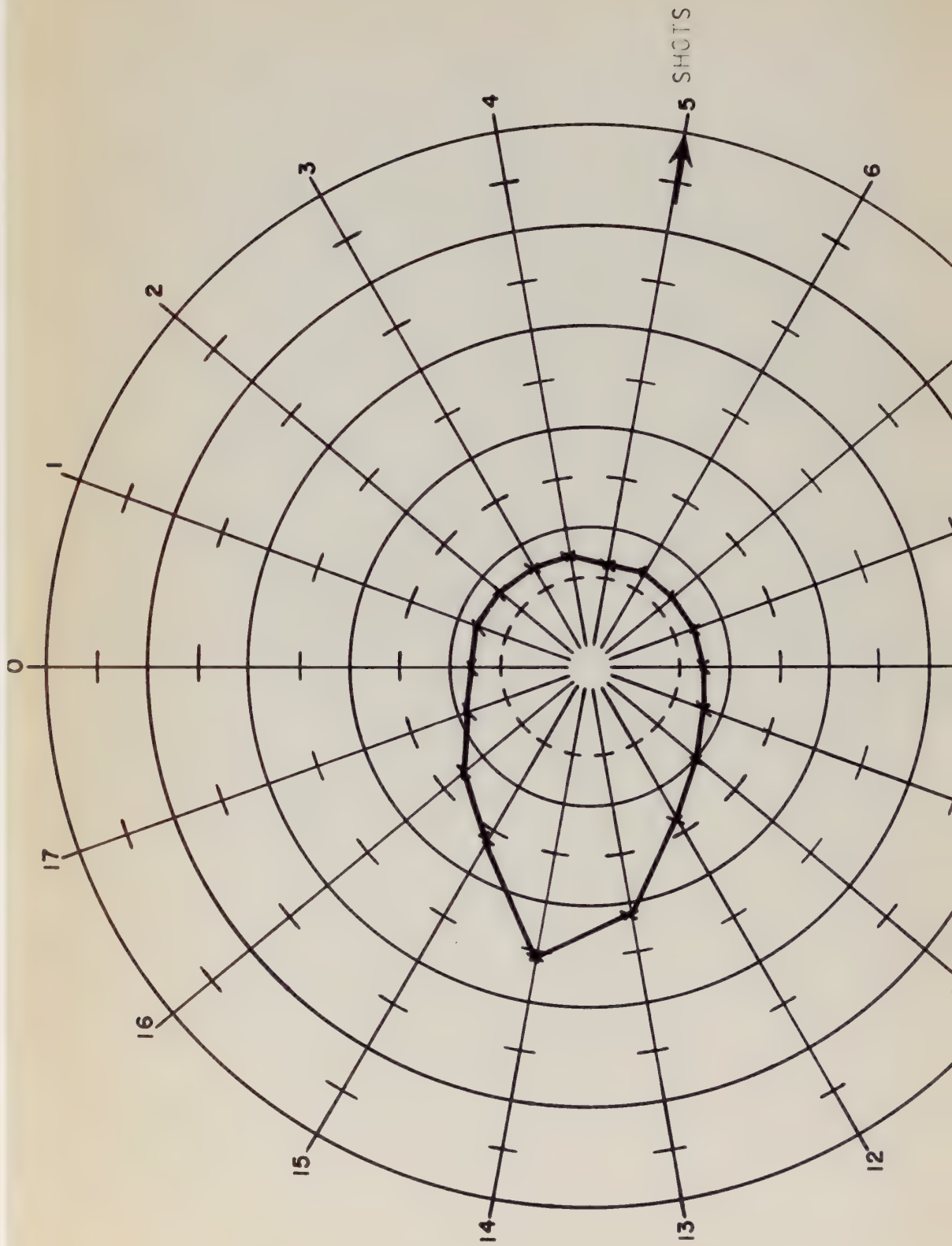


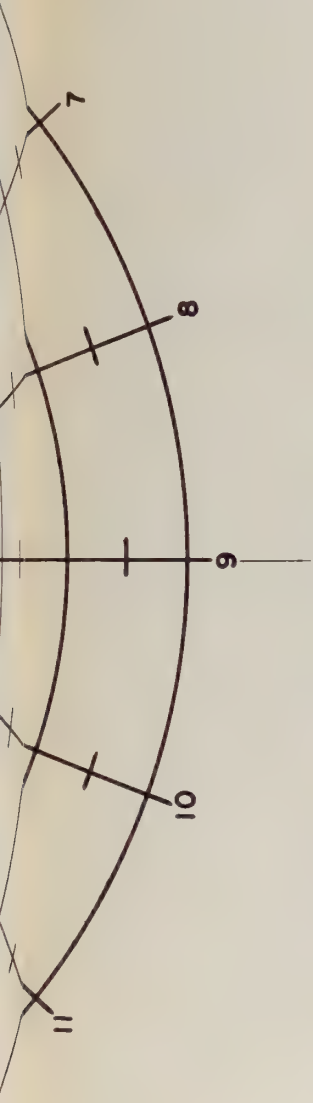
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.



RADIOORIENTATION PLOT POT-B

NO. 2 S. 100' STRAIN PERFORATED 1054-1061 ONE SHO" PER FOOT WITH 1 11/16" HYPERDOME





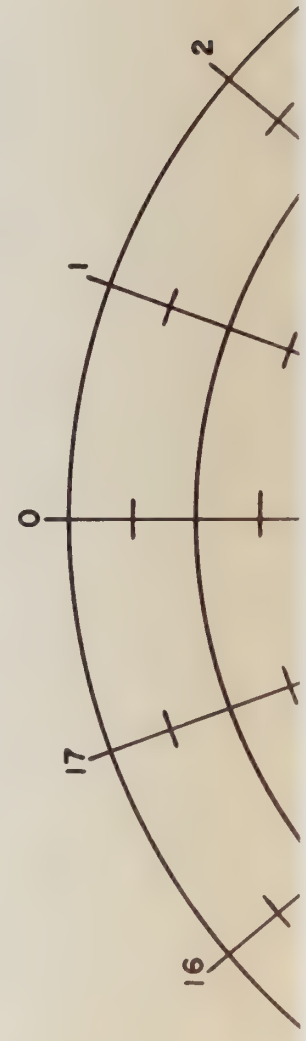
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

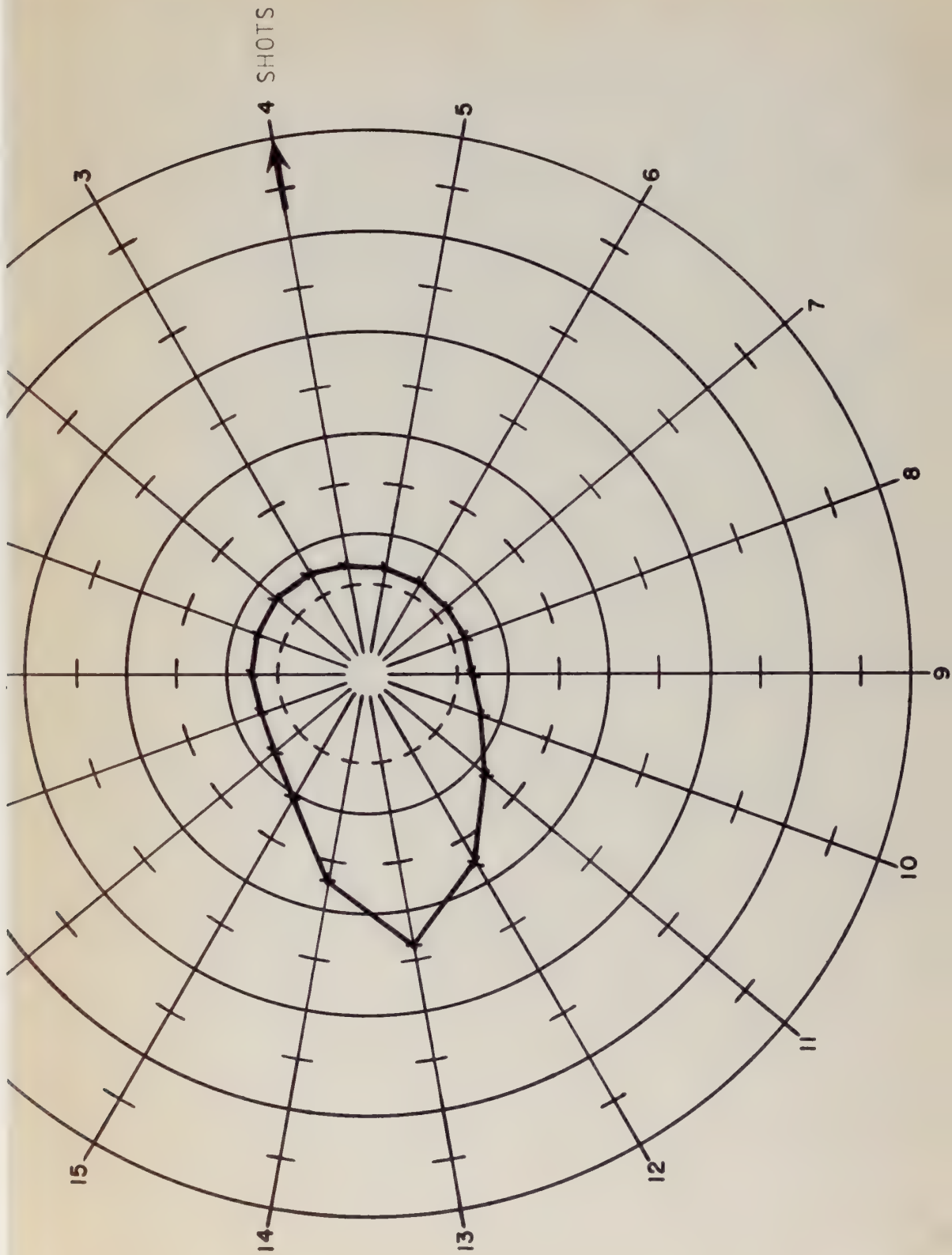


RADIORIENTATION PLOT

POT-B

NO. 2 SHORT STRING PERFORATED 1036-1046 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





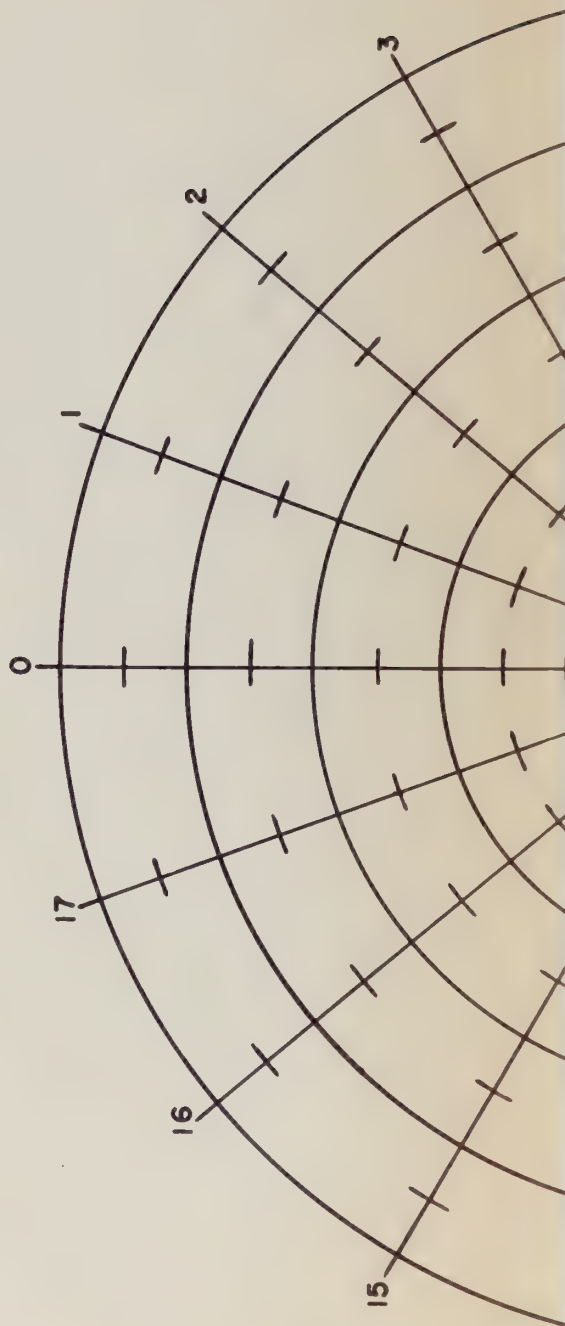
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

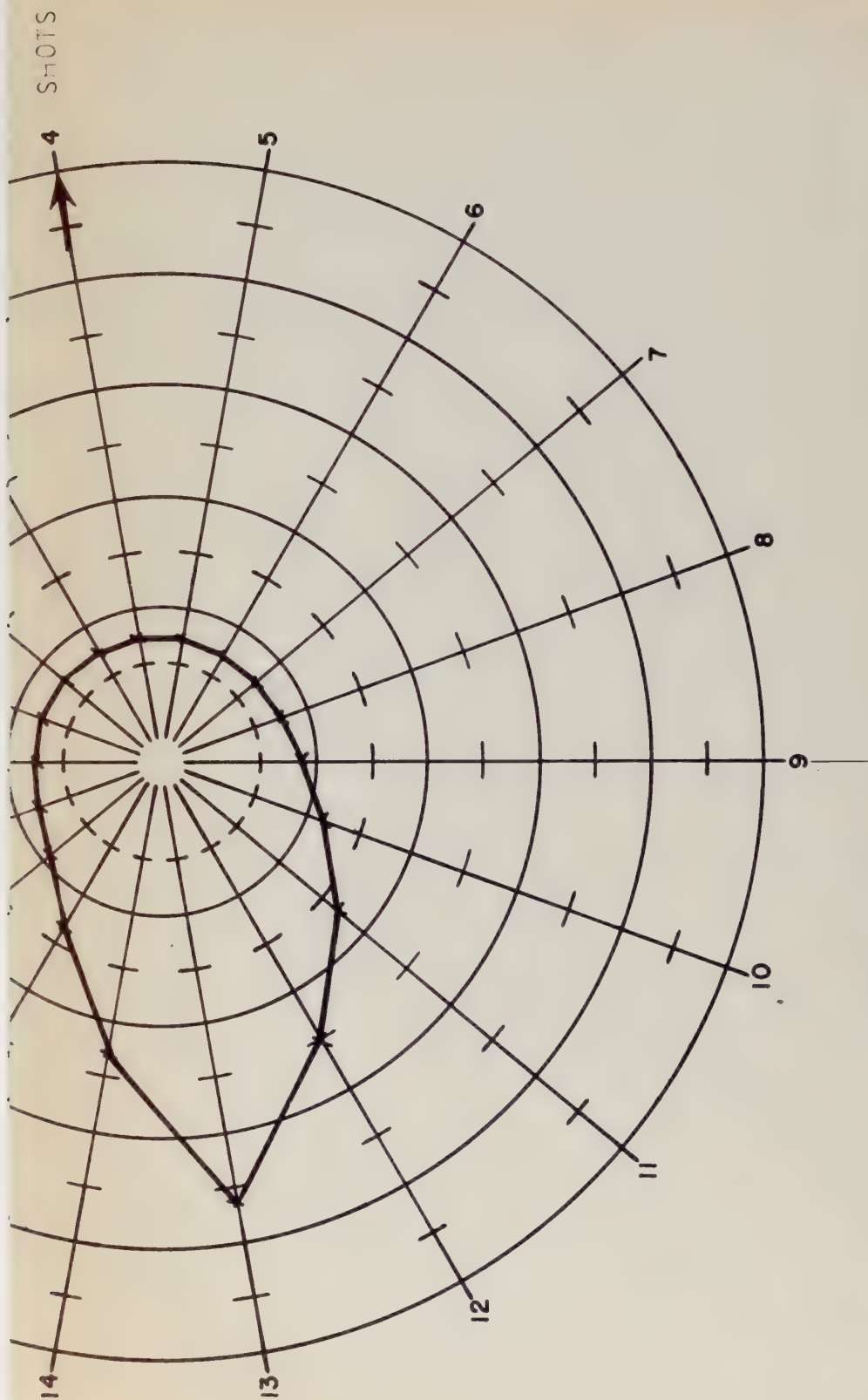
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2 SHORT STRING PERFORATED 1014-1024 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



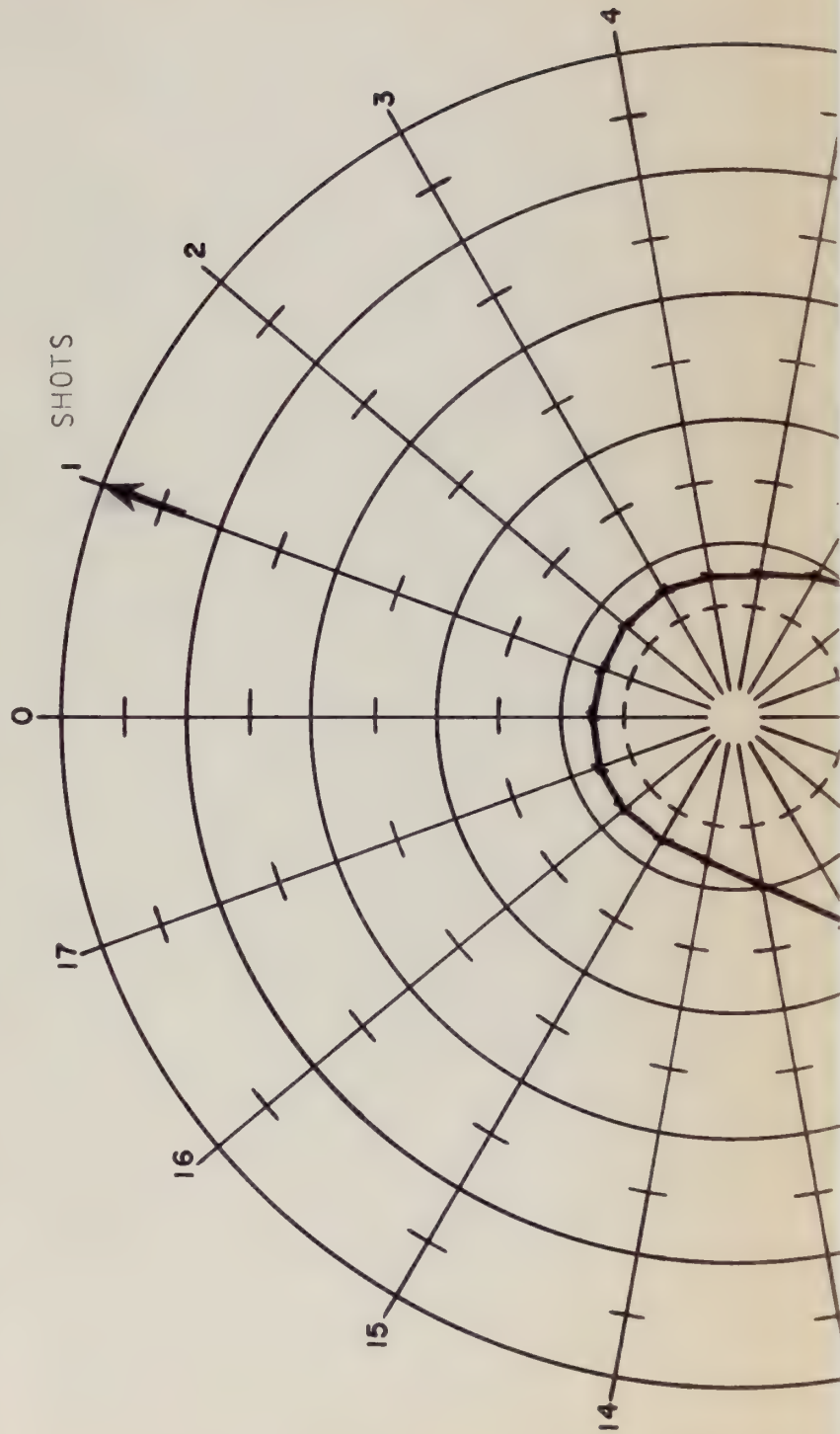


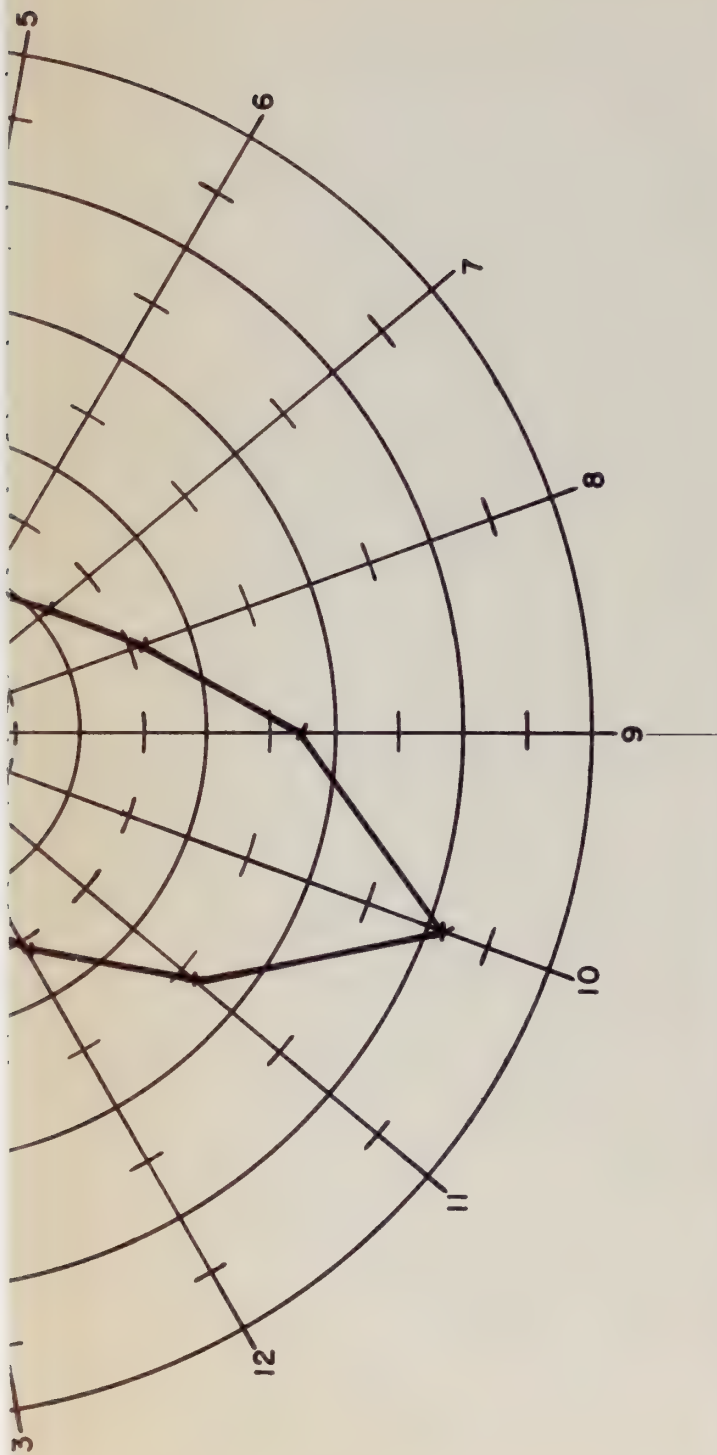
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

NO. 2 SHORT STRING PERFORATED 980-990 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

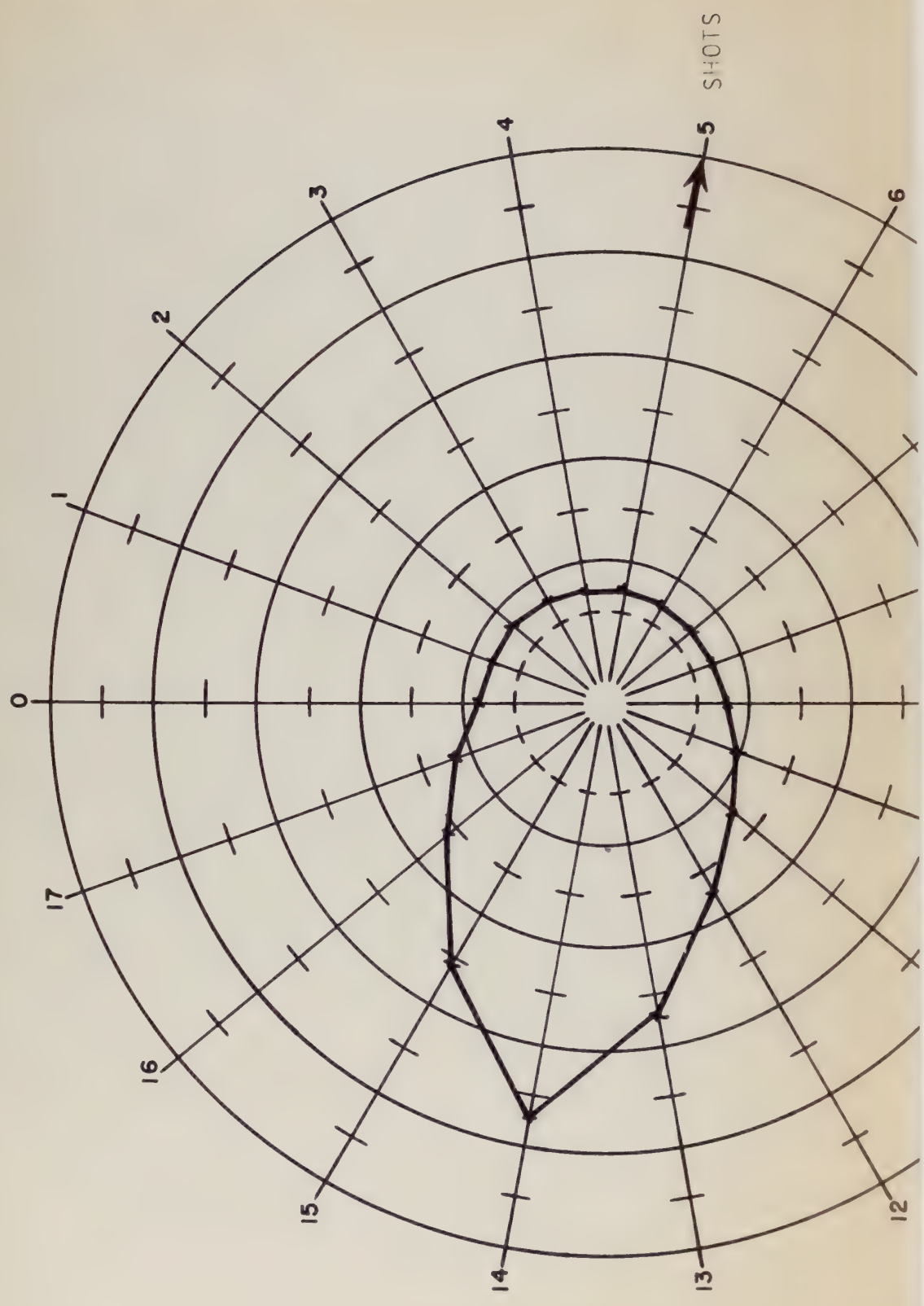


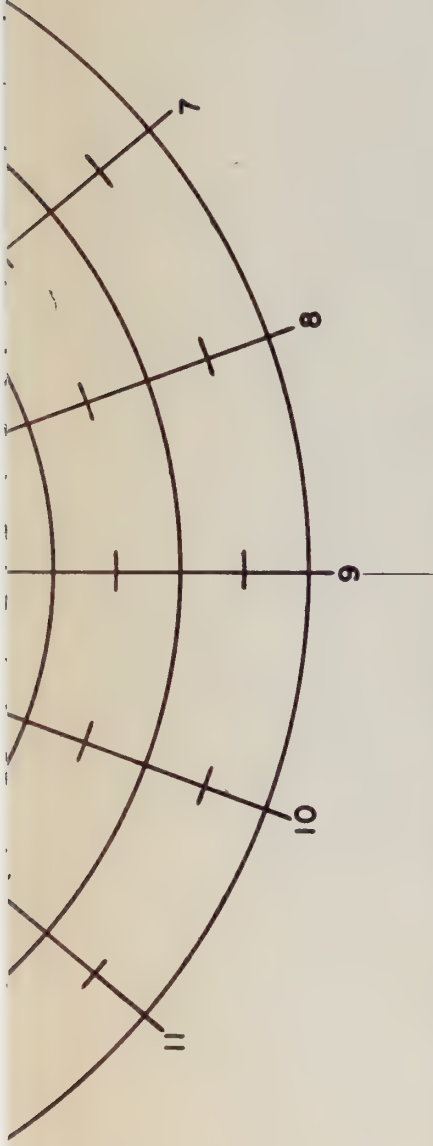


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIO-ORIENTATION PLOT
FOI-B
NO. 2 SHORT STRING PERFORATED 970-979 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





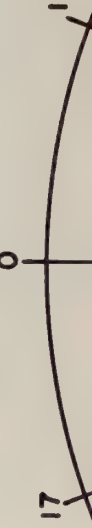
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

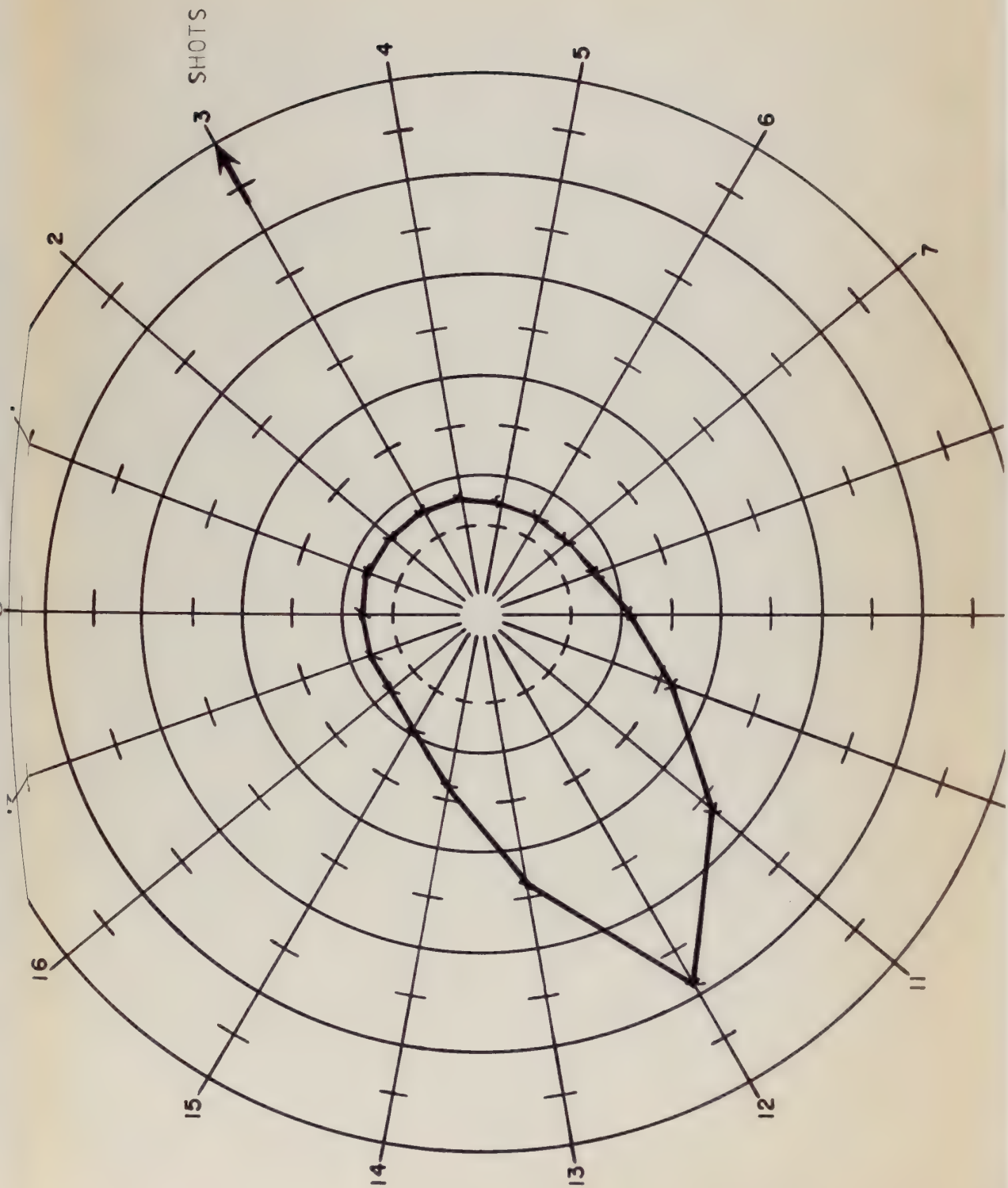
Schlumberger

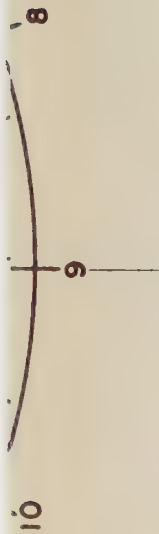
RADIOORIENTATION PLOT

POT-B

NO. 2--SHORT STRING PERFORATED 960--969 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME







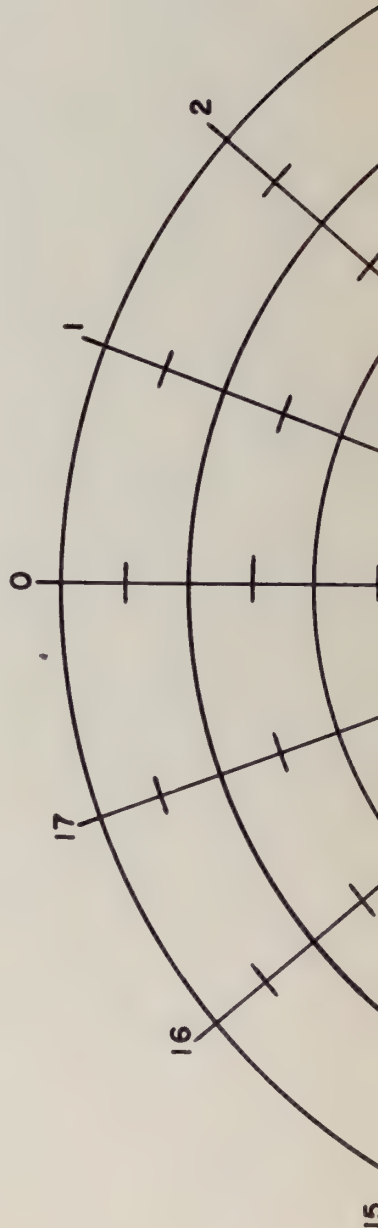
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

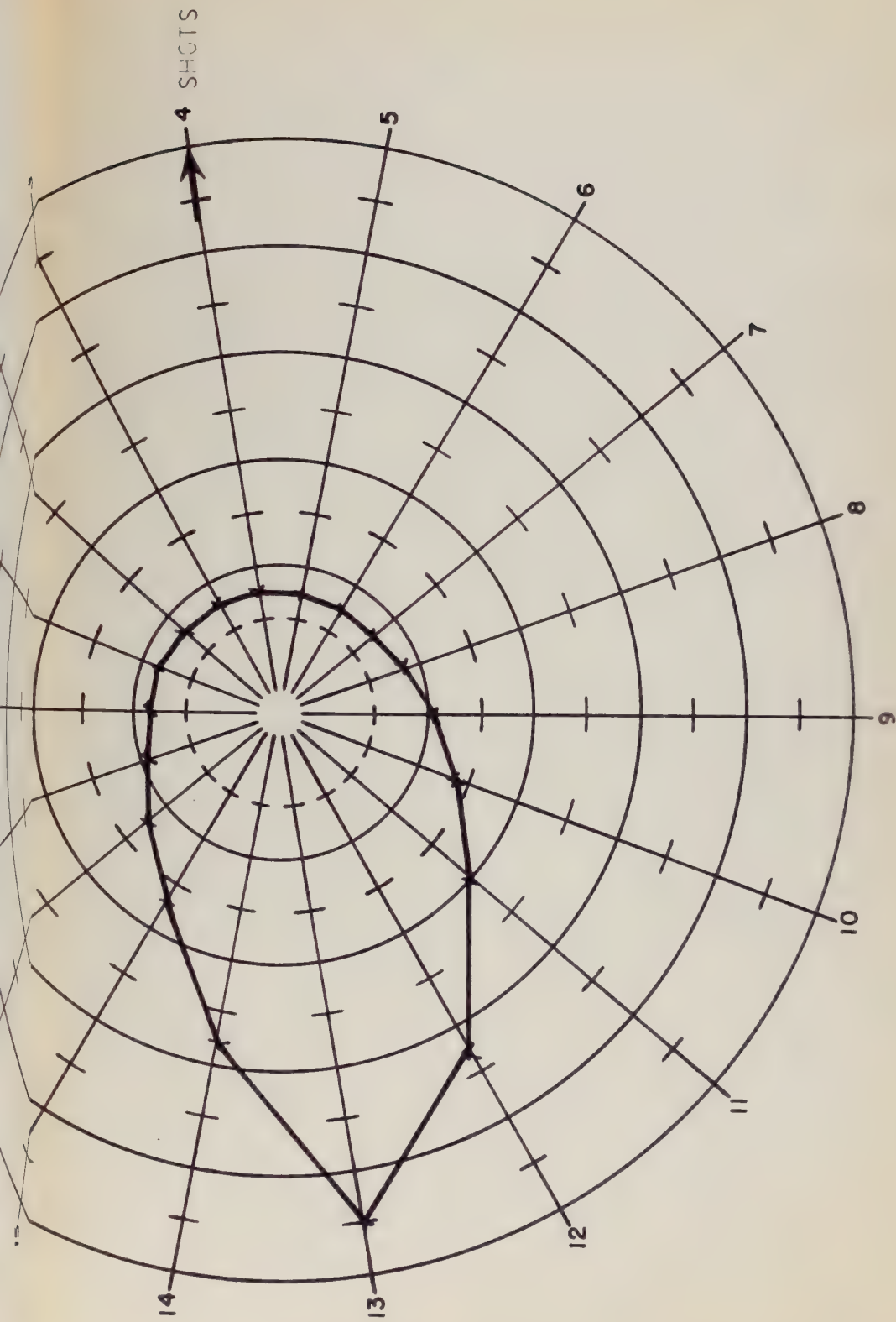
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 2 SHORT STRING PERFORATED 950-959 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



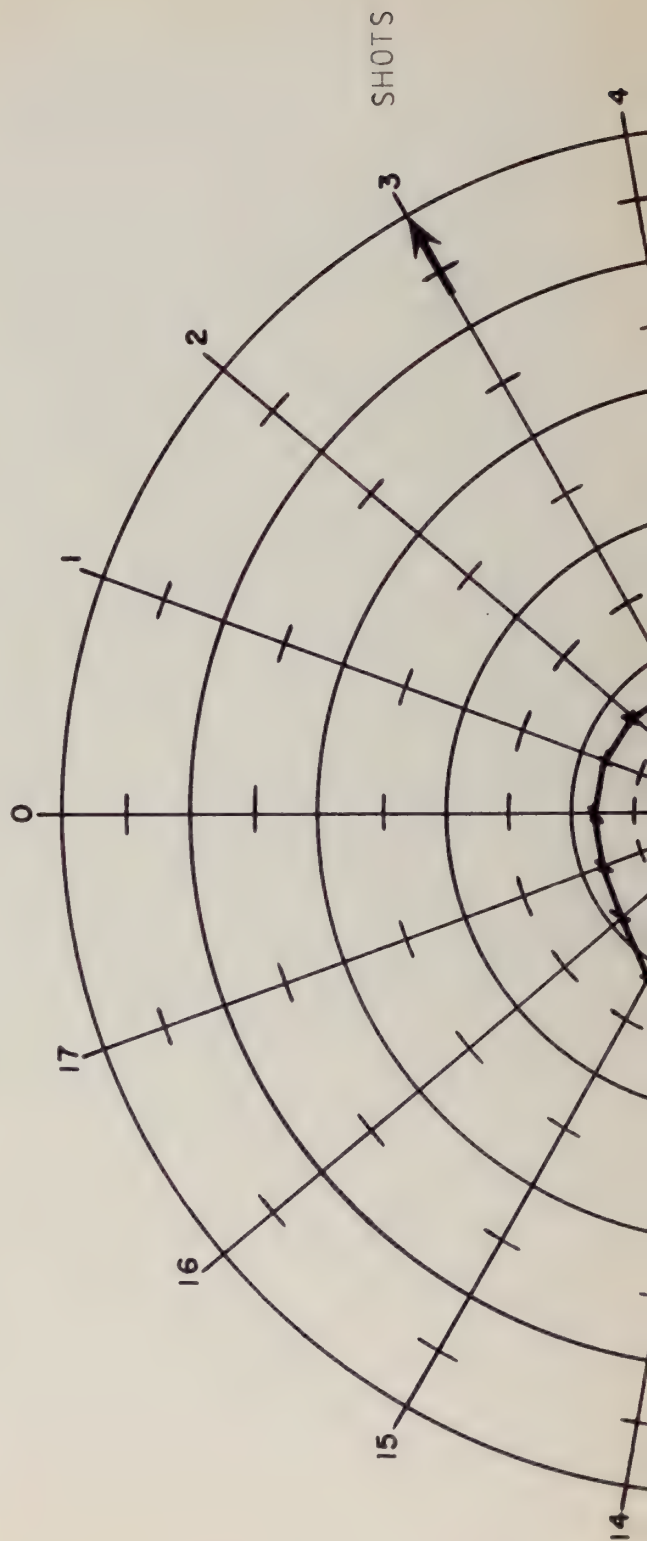


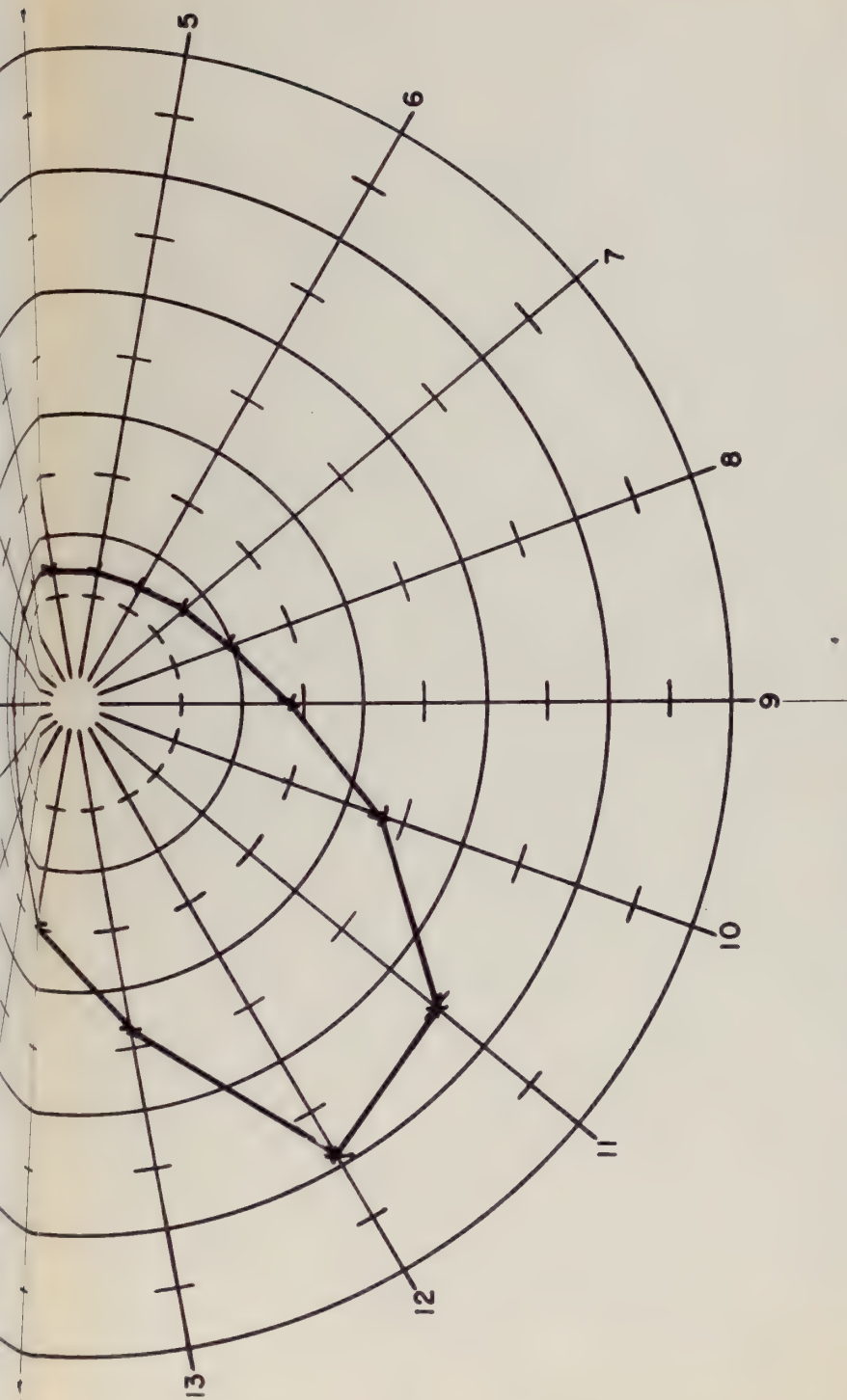
Seibumberger

RADIOORIENTATION PLOT

POT-B

2 SHOTS PERFORED 940-949 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

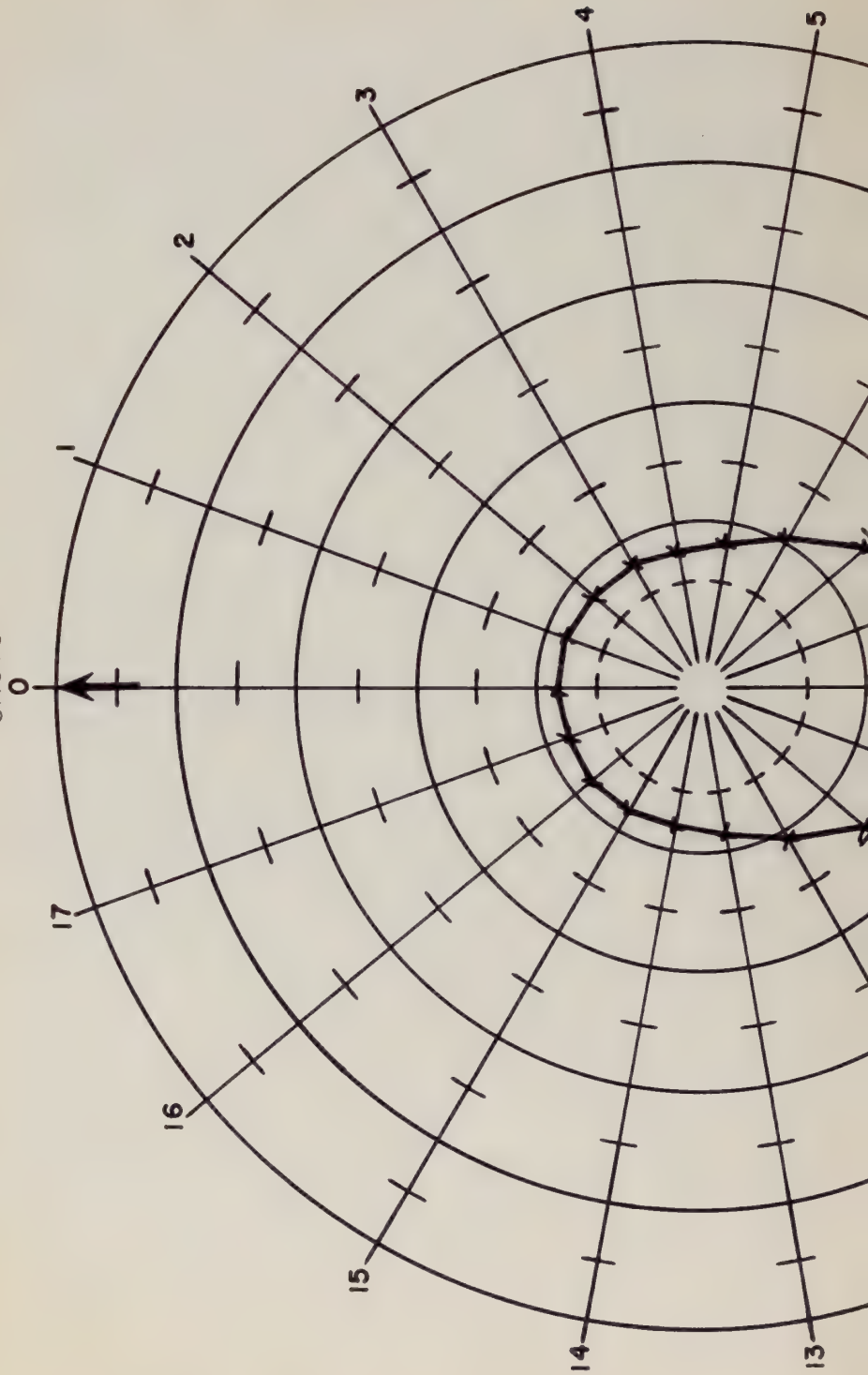
Schlumberger

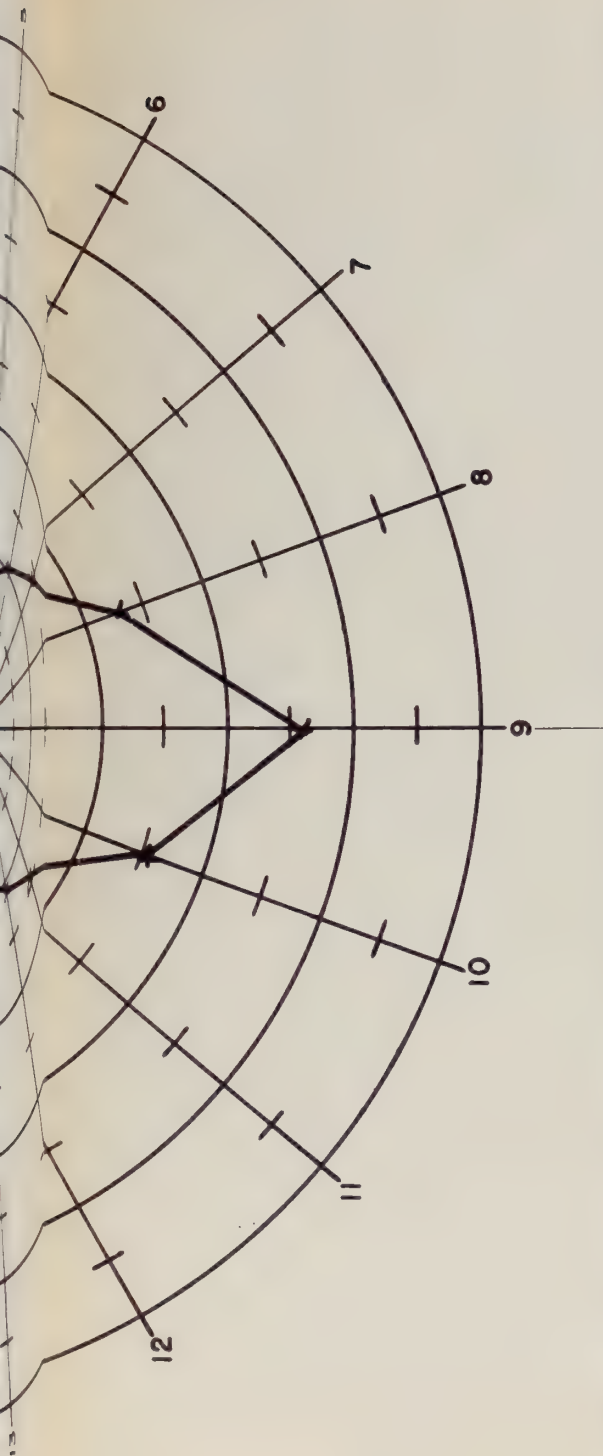
RADIOORIENTATION PLOT

POT-B

10.2 SHORT STRING PERFORATED 930-939 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

SHOTS





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

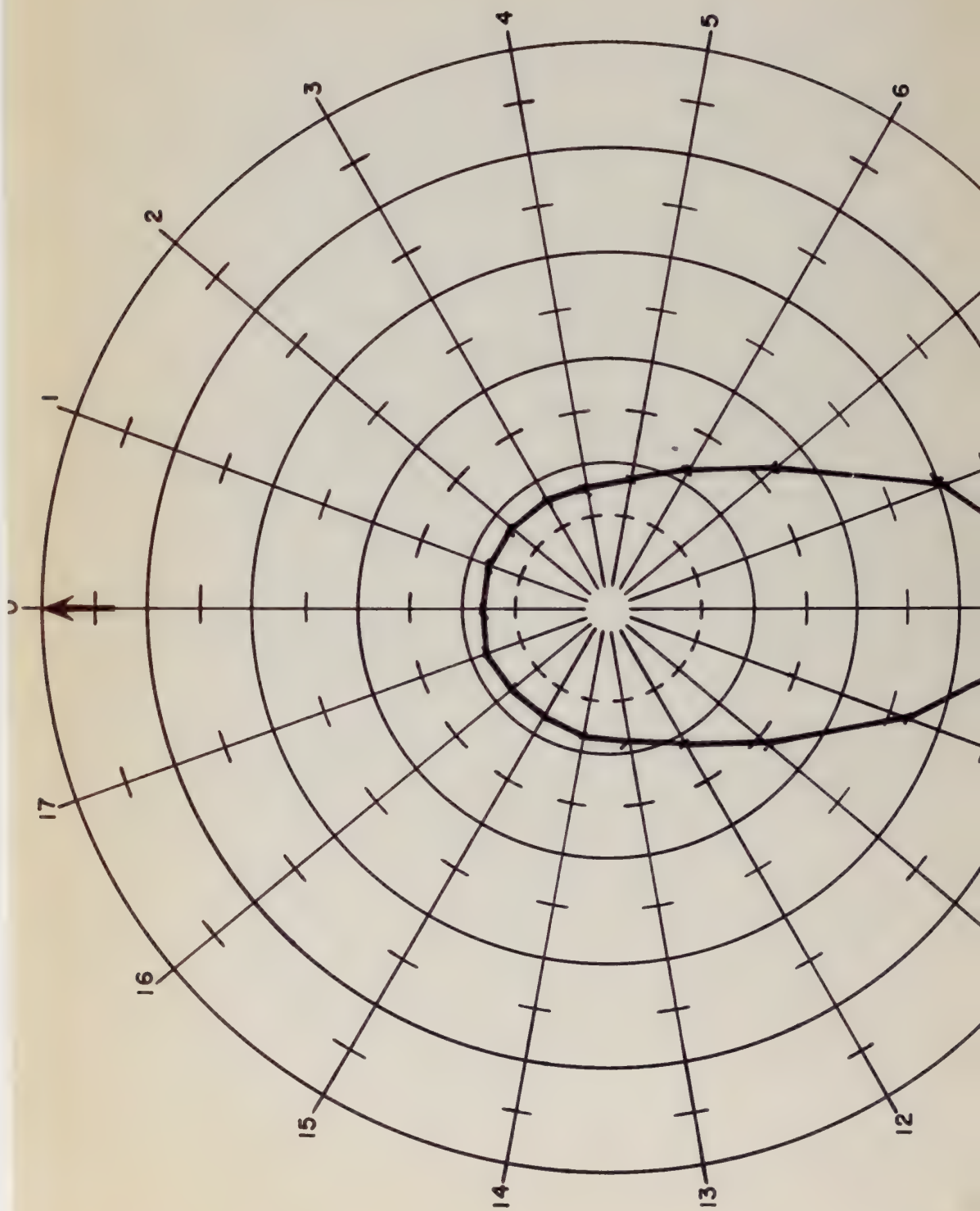
Schlumberger

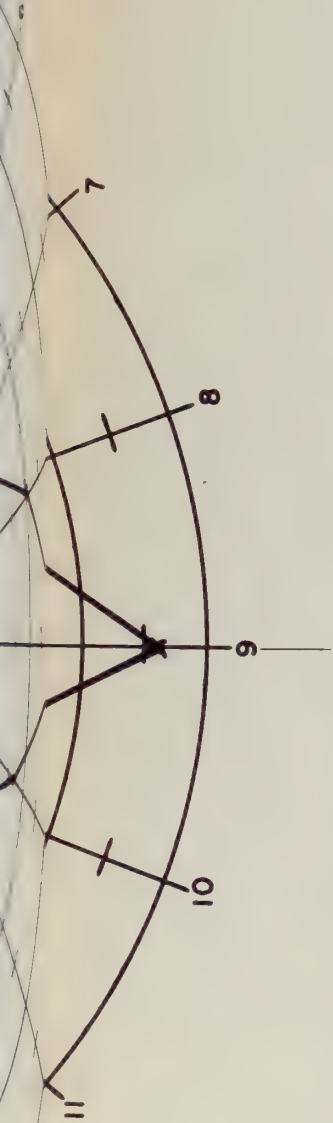
RADIOORIENTATION PLOT

POT-B

A.C.2 S-031 STRIP PERFORATED 920-929 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

S-031





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

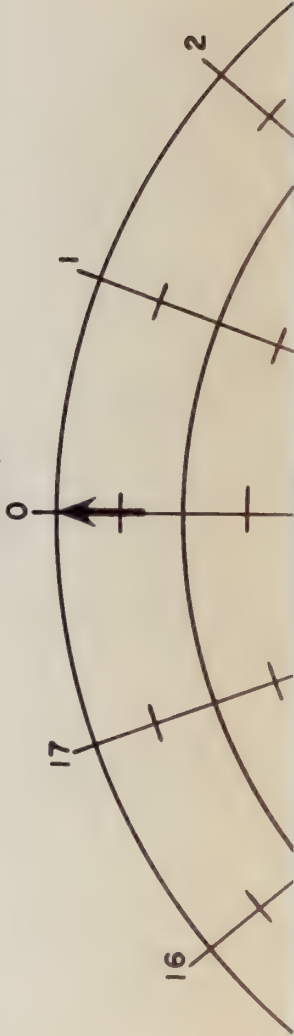


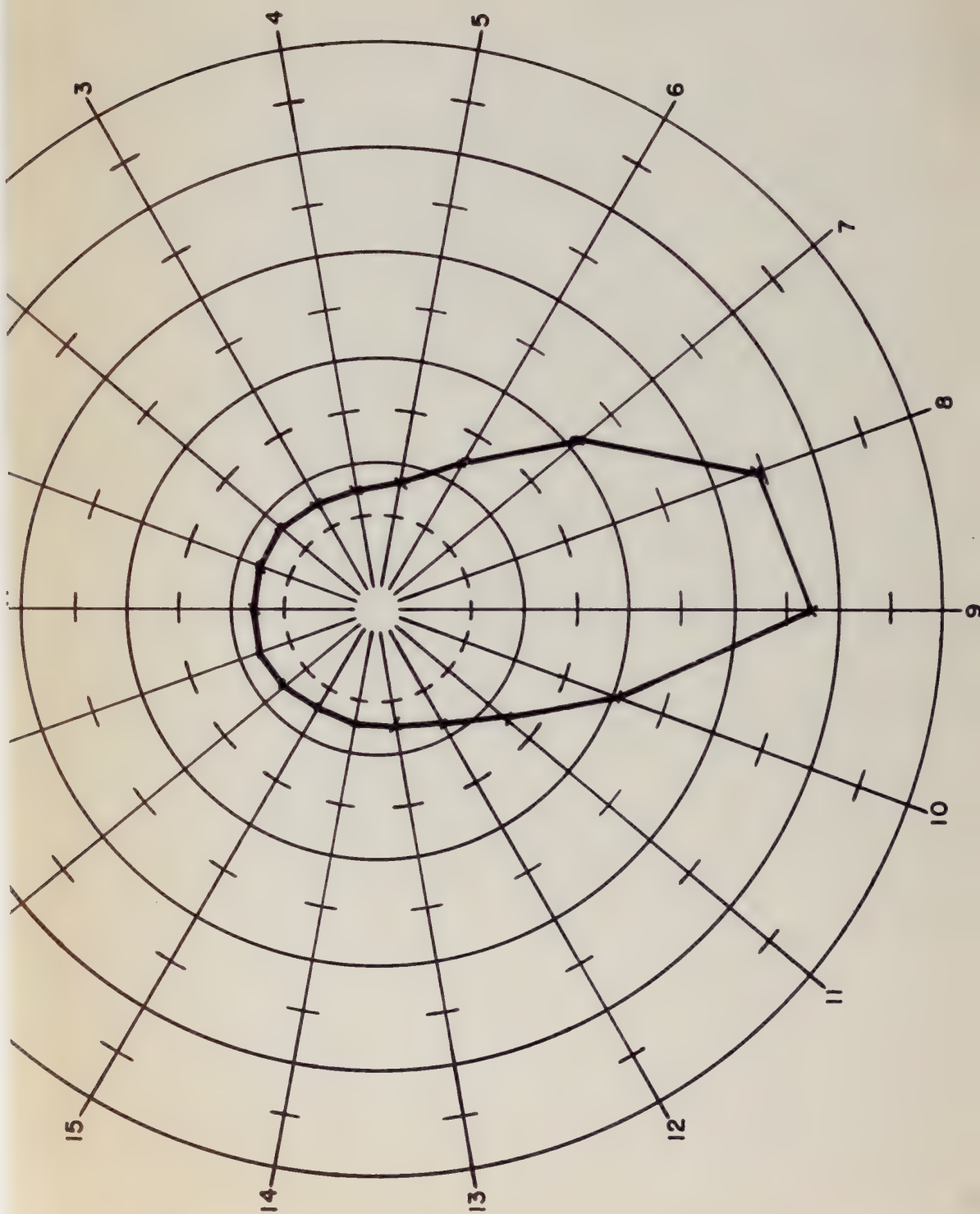
RADIOORIENTATION PLOT

POT-B

NO. 2 SHORT STRING PERFORATED 872-884 ONE SHOT PER FOOT WITH 1 11/16" HYPERMINE

SHOTS





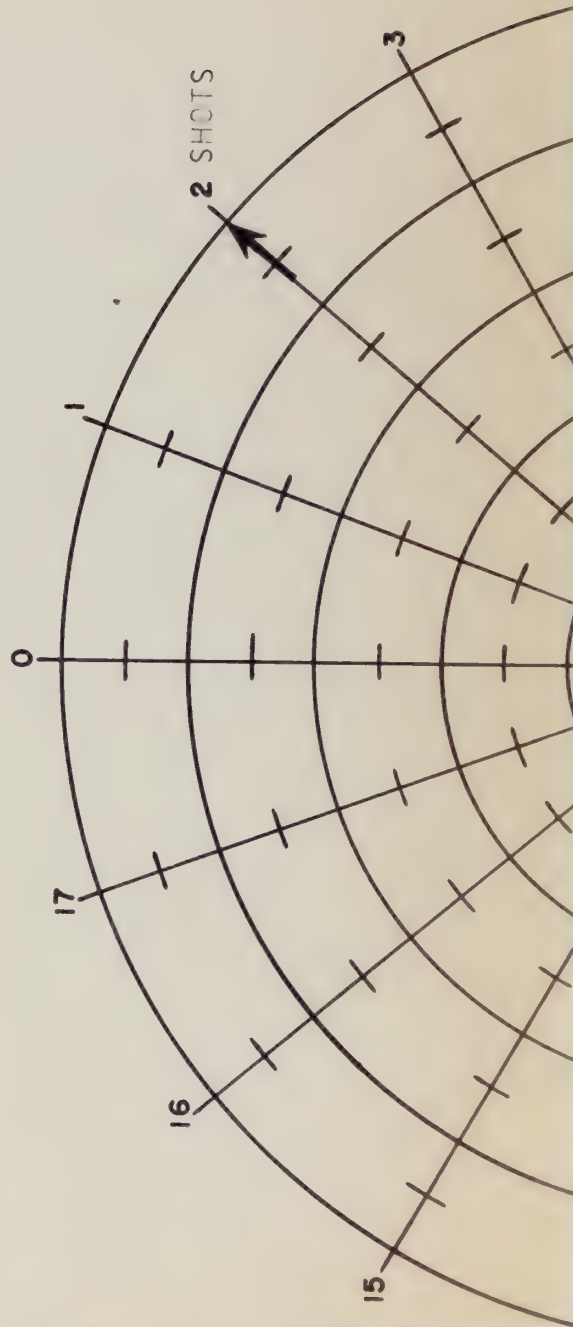
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

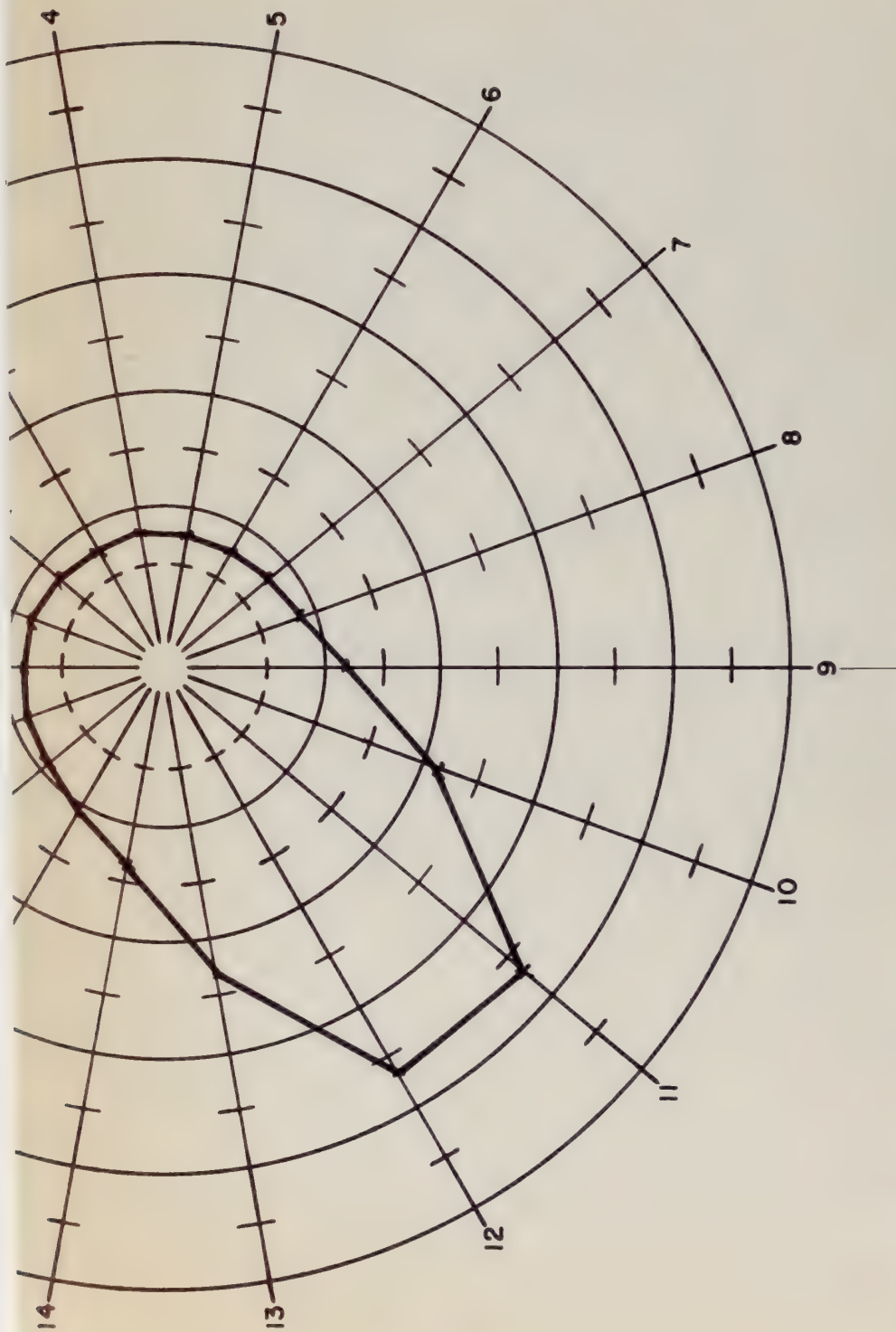
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2-SHORT STRING PERFORATED 939-848 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



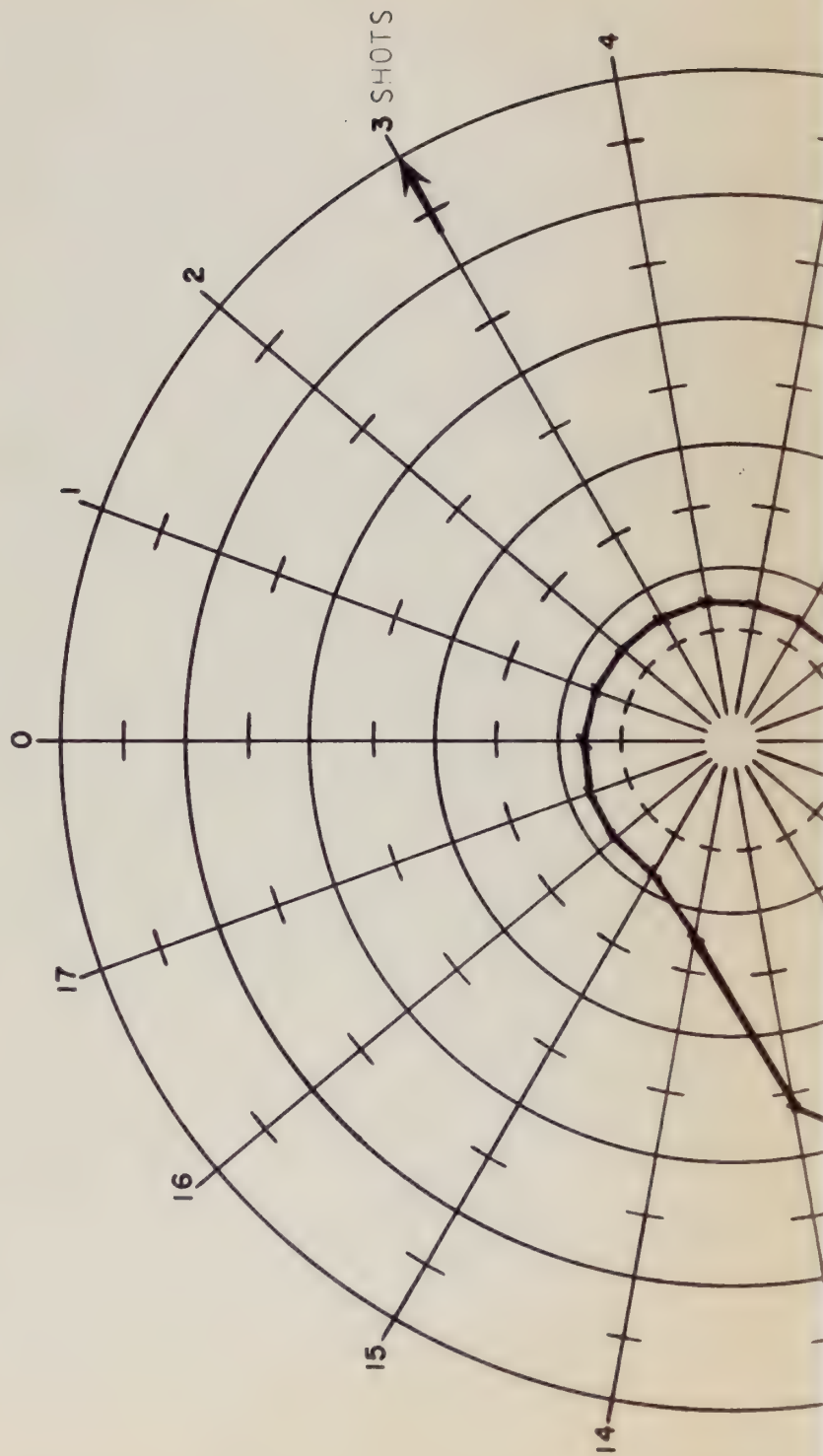


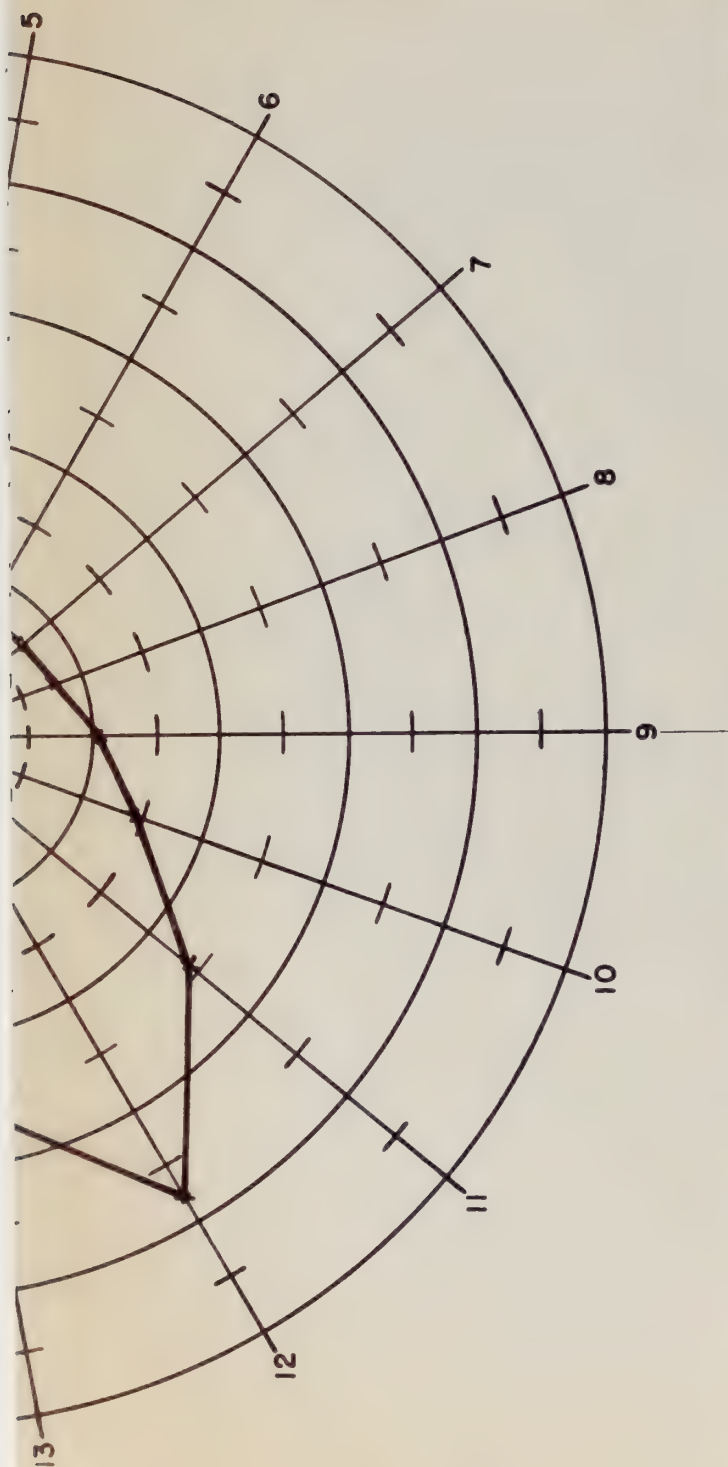
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and depth logging instrument is presented to you in accordance with but subject to the General Terms and Conditions of the Schlumberger Service Contract. The data shown on this chart are for information only and are not to be used for any other purpose without the written consent of Schlumberger.

RADIO-ORIENTATION PLOT

POT-B

NO. 2 SHORT STRING. PERFORATED 827 837 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





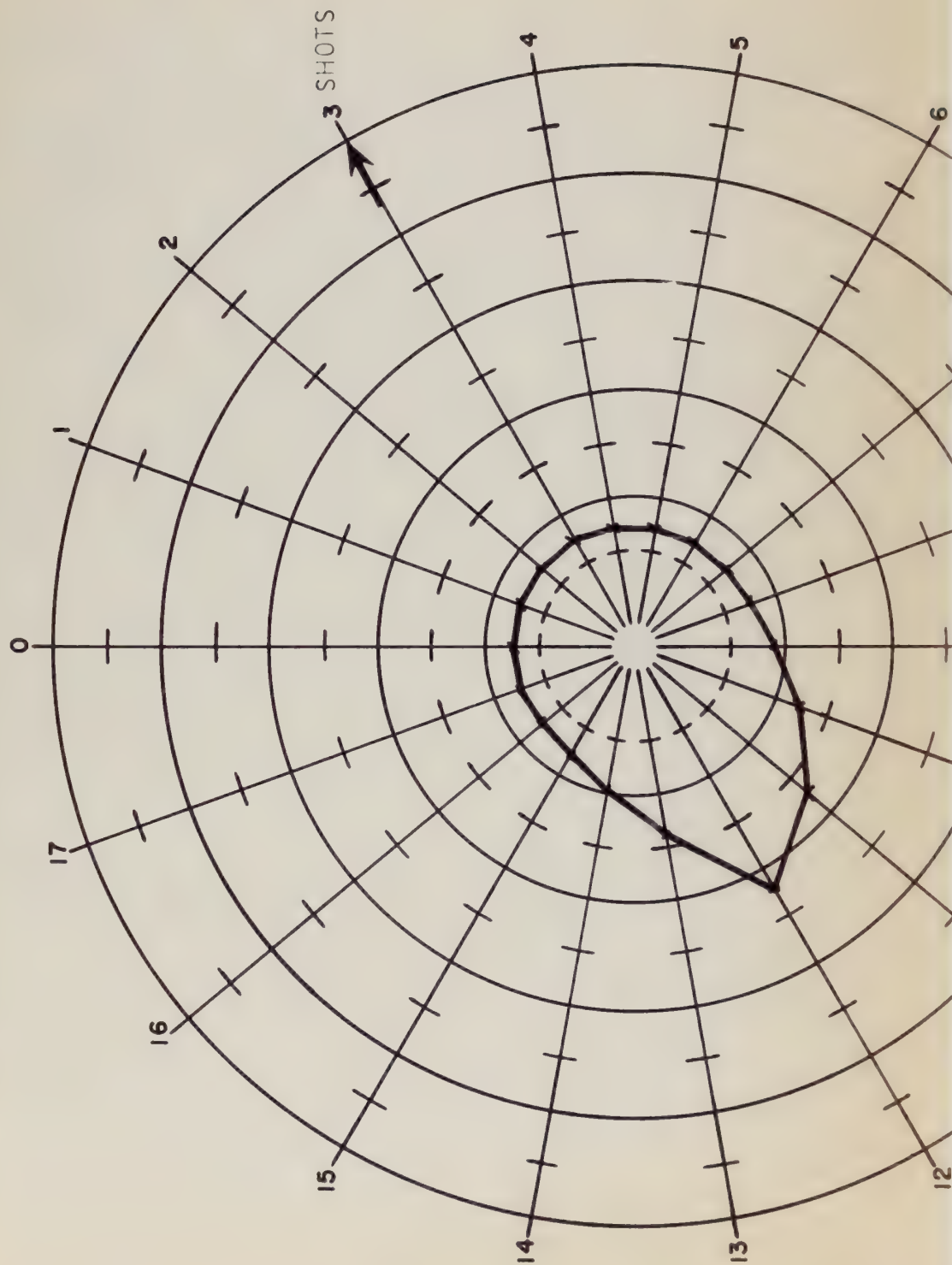
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

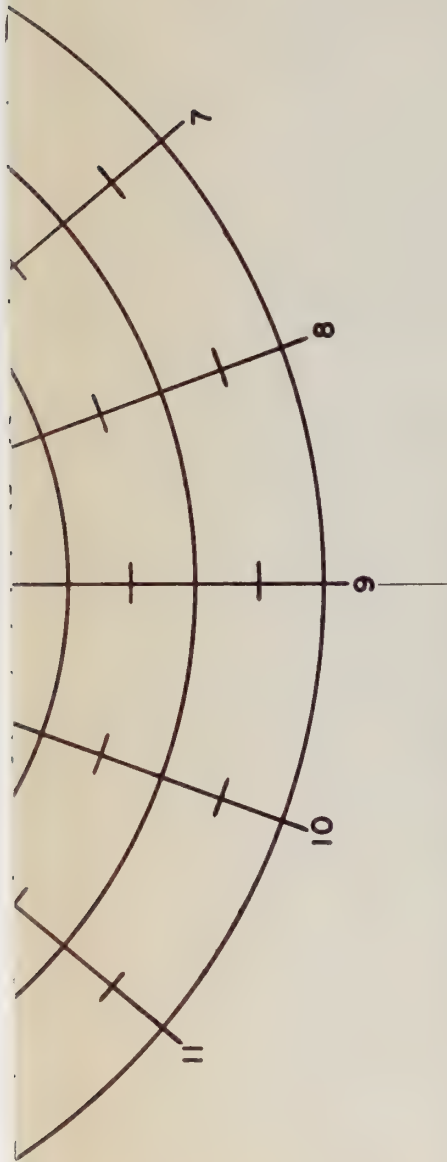
Schlumberger

RADIORIENTATION PLOT

POT-B

NO. 2 SHORT STRING PERFORATED 816-826 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



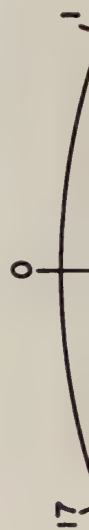


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

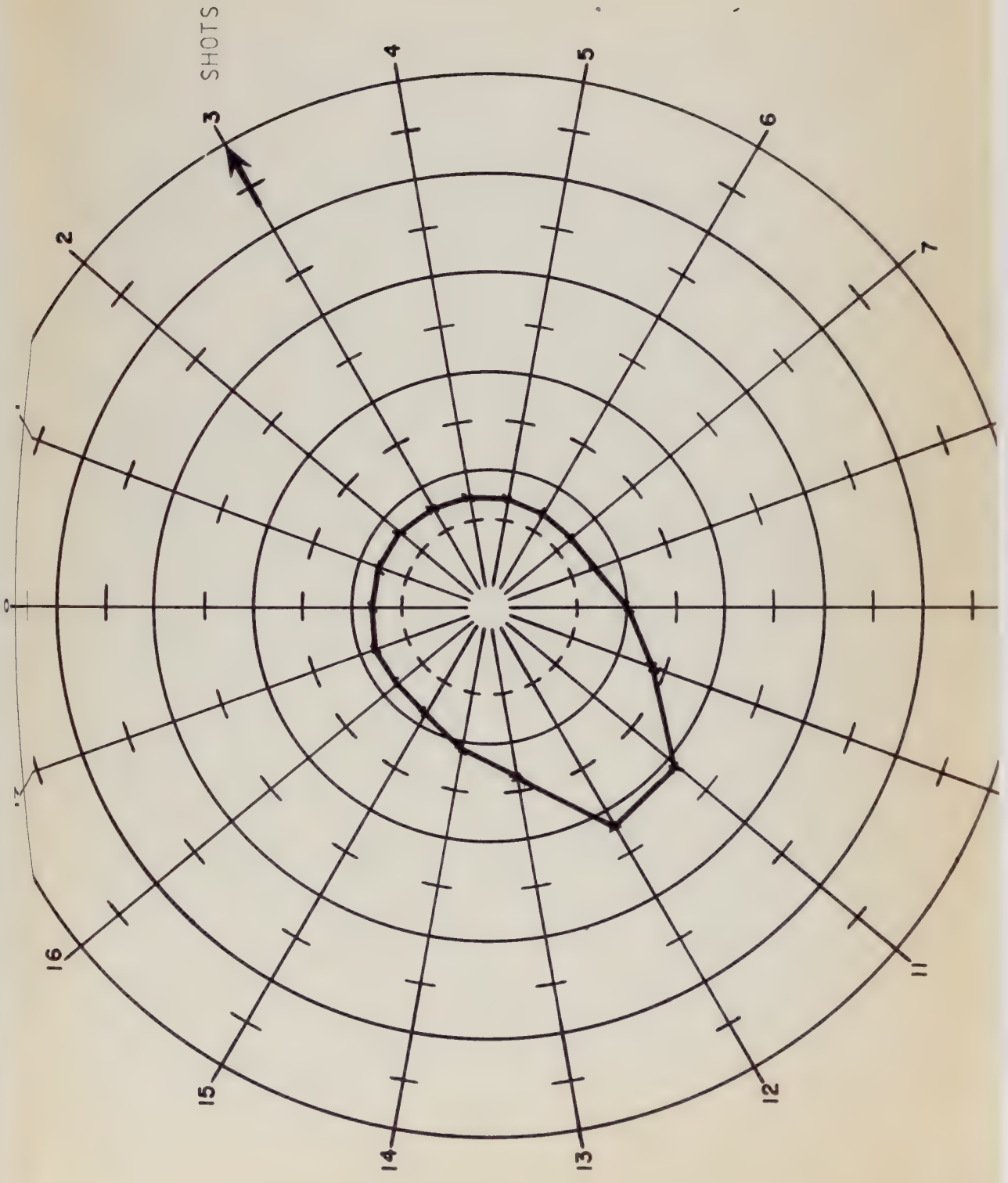
Schlumberger

RADIOORIENTATION PLOT

NO. 2 SHORT STRING PERFORATED POT-B ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



3 SHOTS





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

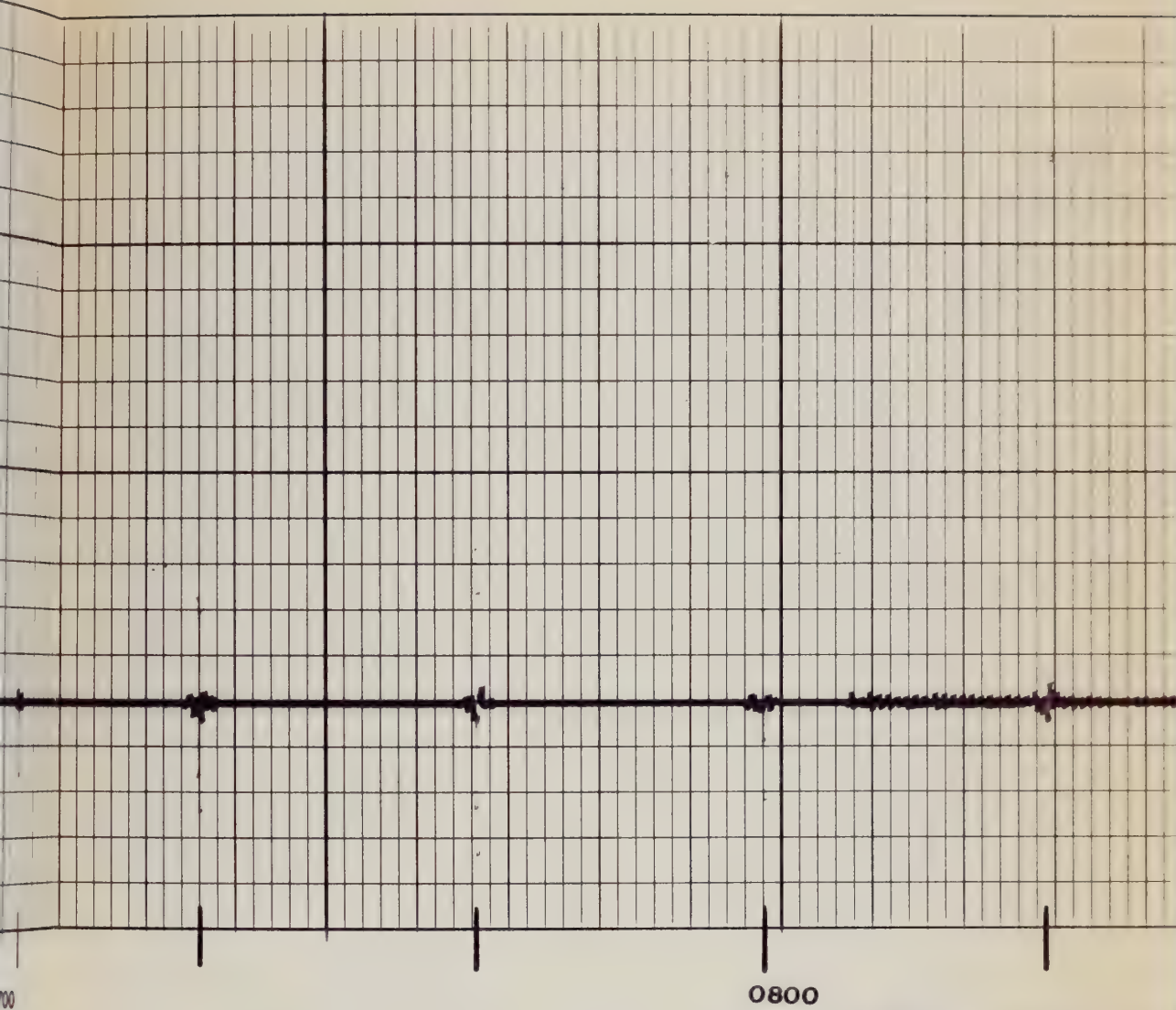
Schlumberger

CASING COLLAR LOG
AFTER PERFORATION

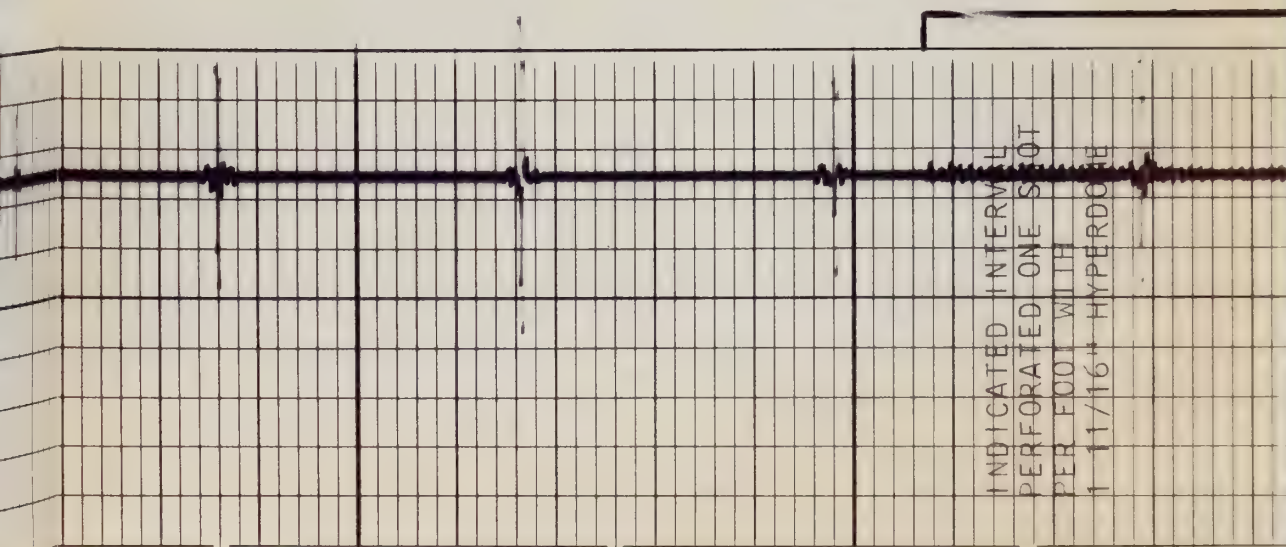
PTH

NO. 2 - SHORT STRING

0700



0800

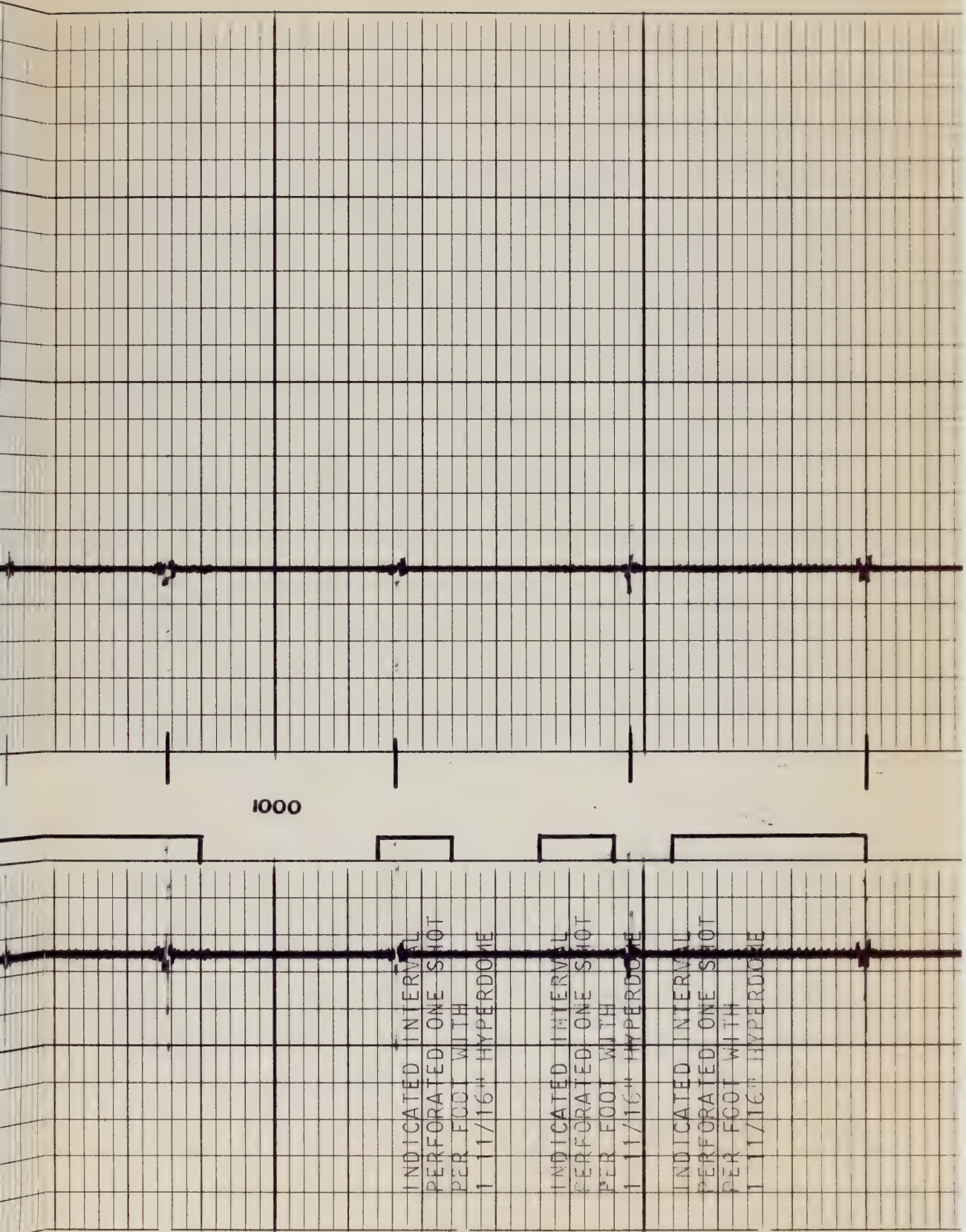


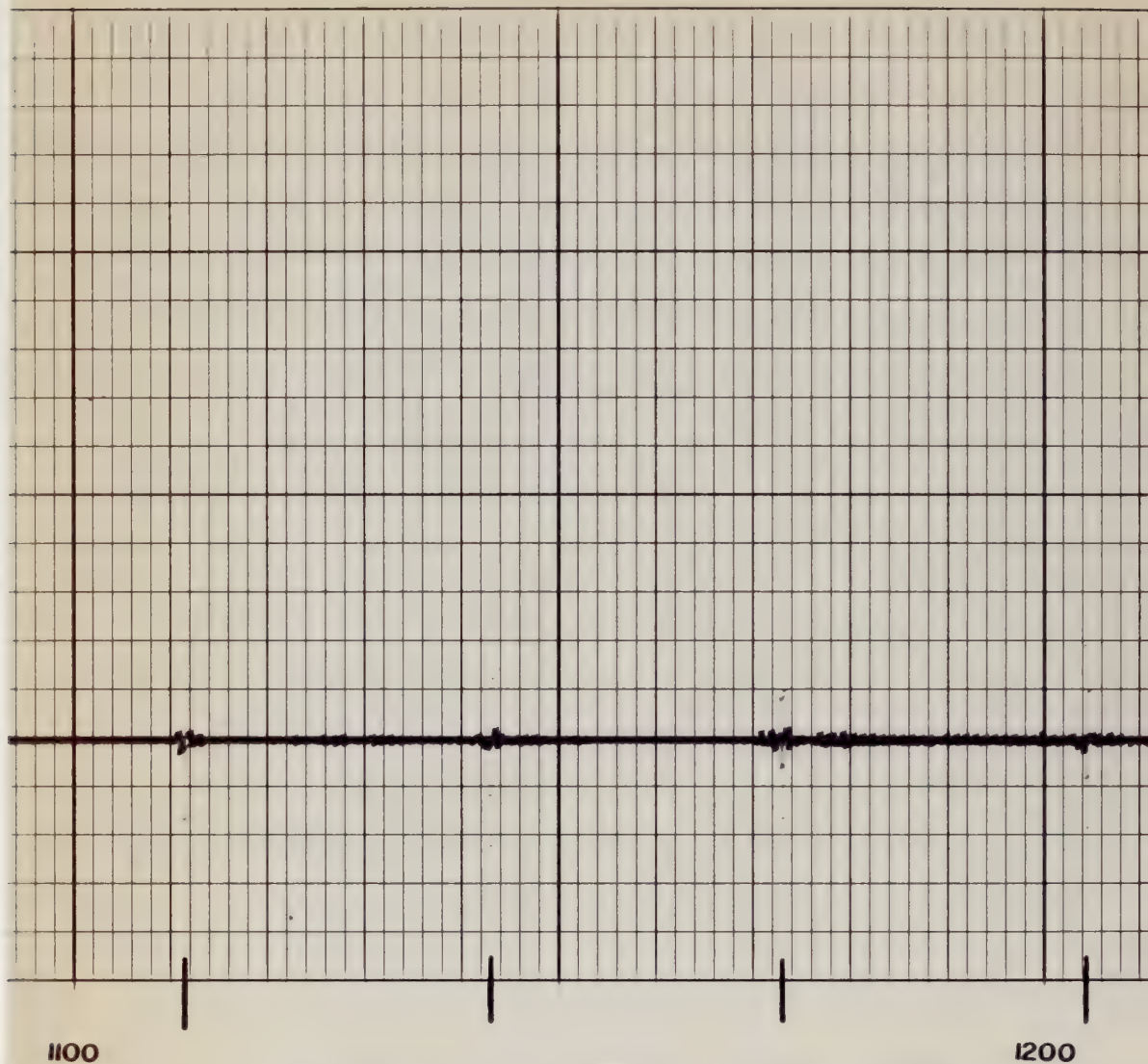
INDICATED INTERVAL
PERFORATED ONE SLOT
PER FOOT WITH
1 11/16" HYPERDOME

INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH 1 1/16"
HYPERDOME

INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH
1 1/16" HYPERDOME

0900



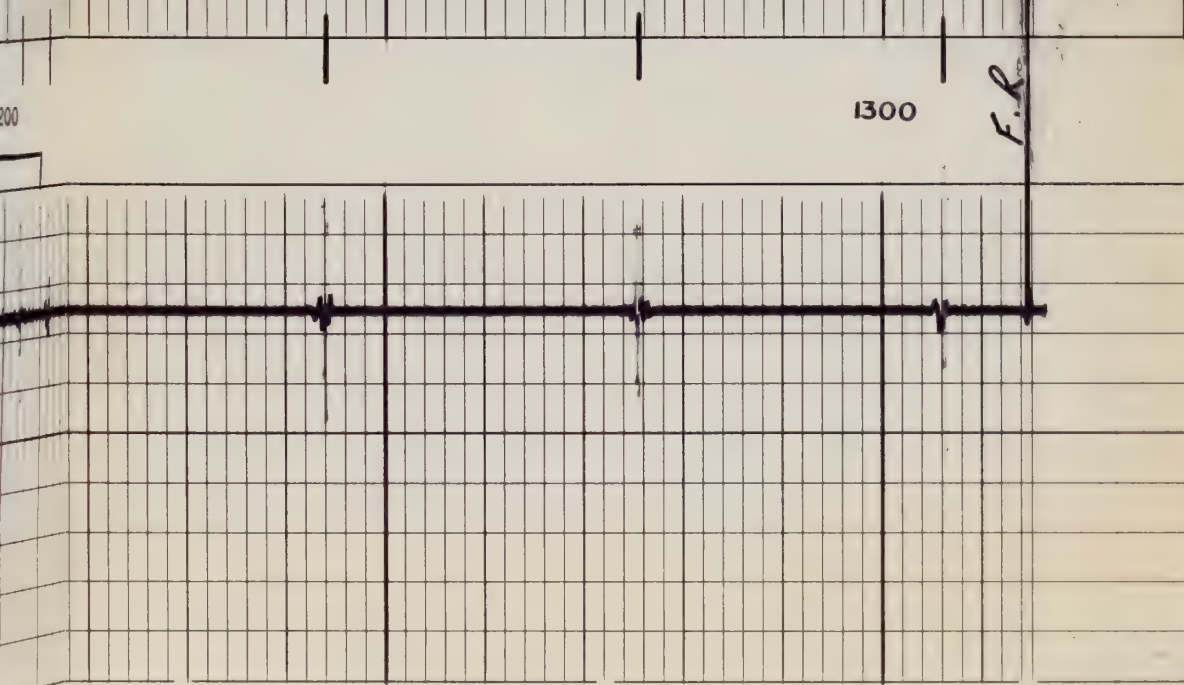
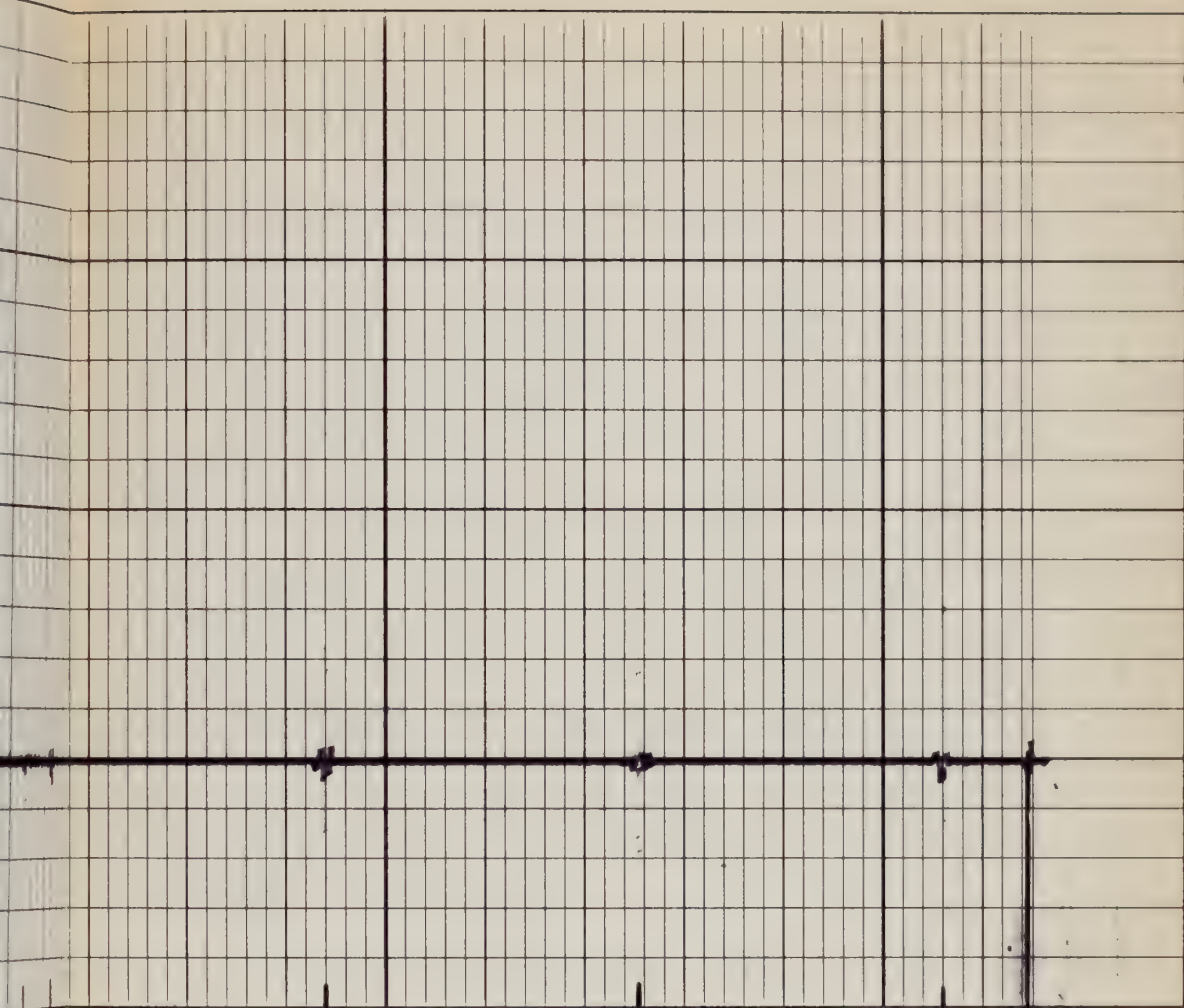


1100

1200

INDICATED INTERVAL
PERFORATED ONE SLOT
PER FOOT WITH
1 11/16" HYPERDOME

INDICATED INTERVAL
PERFORATED ONE SLOT
PER FOOT WITH
1 11/16" HYPERDOME



1300

F.R.

COMPANY _____

WELL _____

S.G. NO. 9

FIELD _____

RIO BLANCO, COLORADO

Schlumberger

PRODUCTION LOGGING SERVICES

Schlumberger

CEMENT BOND LOG

VDL-CCL

COUNTY RIO BLANCO
Field or
LOCATION SORGHUM GULCH
WELL S.G. NO. 9
COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL S.G. NO. 9

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION API Serial No. _____
Sec. 11 Twp. 3S Rge. 97W

Other Services:

Permanent Datum: GROUND LEVEL, Elev. 6870
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.I. 6870

Date	<u>10/29/74</u>	Type Drill Fluid	<u>WATER</u>
Run No.	<u>NO. 1 STRING NO. 2 STR.</u>	Fluid Level	<u>FULL</u>
Depth — Driller	<u>-----</u>	Max. Rec. Temp.	<u>-----</u> °F
Depth — Logger	<u>2720 1338</u>	Est. Cement Top	<u>830</u>
Btm. Log Interval	<u>2712 1330</u>	Equip. Location	<u>3882 VERNAL</u>
Top Log Interval	<u>700 700</u>	Recorded By	<u>ST. AUBYN</u>
Open Hole Size	<u>7 7/8</u>	Witnessed By	<u>MR. BURNS</u>

CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String	<u>8 5/8</u>			<u>T&C</u>	<u>SURF</u>	<u>85</u>
String (1)	<u>2 3/8</u>	<u>4.7</u>		<u>T&C</u>	<u>SURF</u>	<u>2740</u>
String (2)	<u>2 3/8</u>	<u>4.7</u>		<u>T&C</u>	<u>SURF</u>	<u>1330</u>
Liner						

PRIMARY CEMENTING DATA

STRING	Surface	Protection	Production	Liner
Vol. of cement			<u>425 SKS</u>	
Type of cement			<u>HOWCO LT. WT.</u>	
Additive			<u>104/SK-GILSONITE</u>	
Retarder				
Wt. of slurry				
Water loss				
Type fluid in csg.				
Fluid wt.				

FOLD HERE

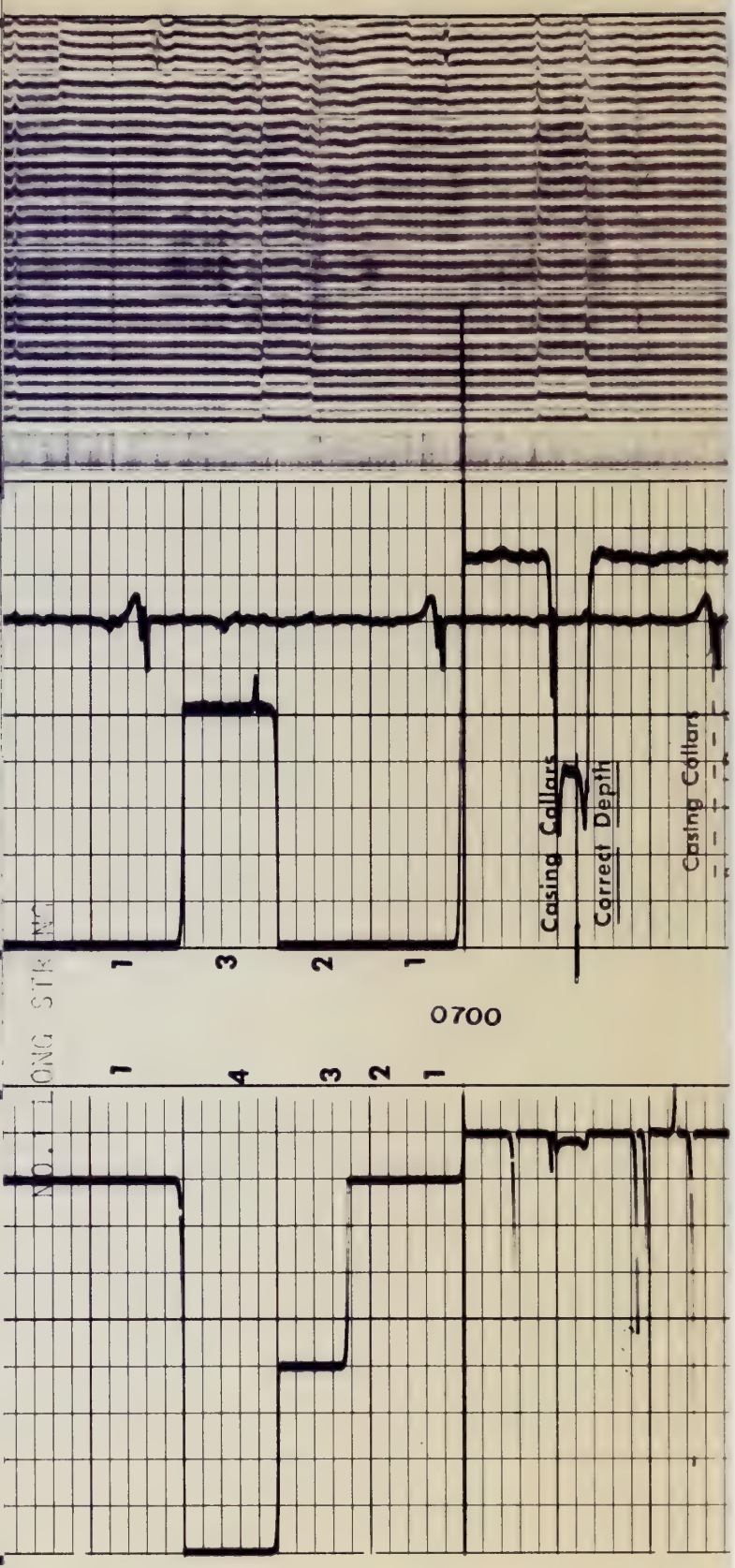
The well name, location and borehole reference data were furnished by the customer.

PRIMARY CEMENTING PROCEDURE		REMARKS	
	Hour — date	Hours from start of operation	Service Order No. _____
Started pumping cement	22:30-10/25/74		Csg. Collars Recorded 15 ft. DEEP
Release pressure	23:30-10/25/74		
Start Cement Bond Log	08:00-10/29/74		
Finish Cement Bond Log	19:00-10/29/74		
Preceding fluid	Volume _____ bbls.	Pipe reciprocated during Pumping: Yes _____ No _____	
Cement pumped	_____ bbls./minute	Pipe reciprocated after plug down: Yes _____ No _____	

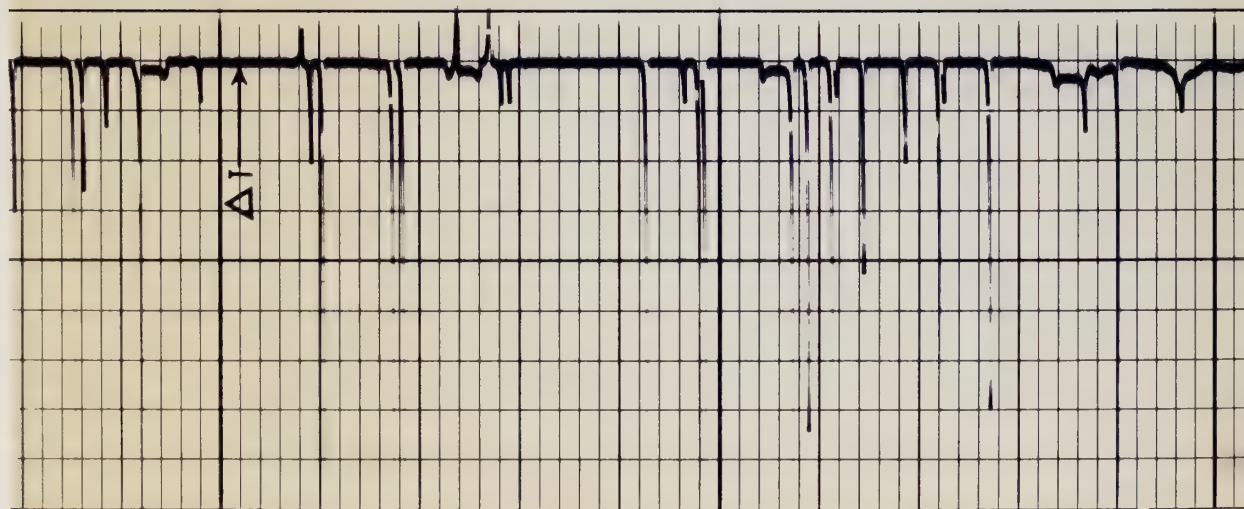
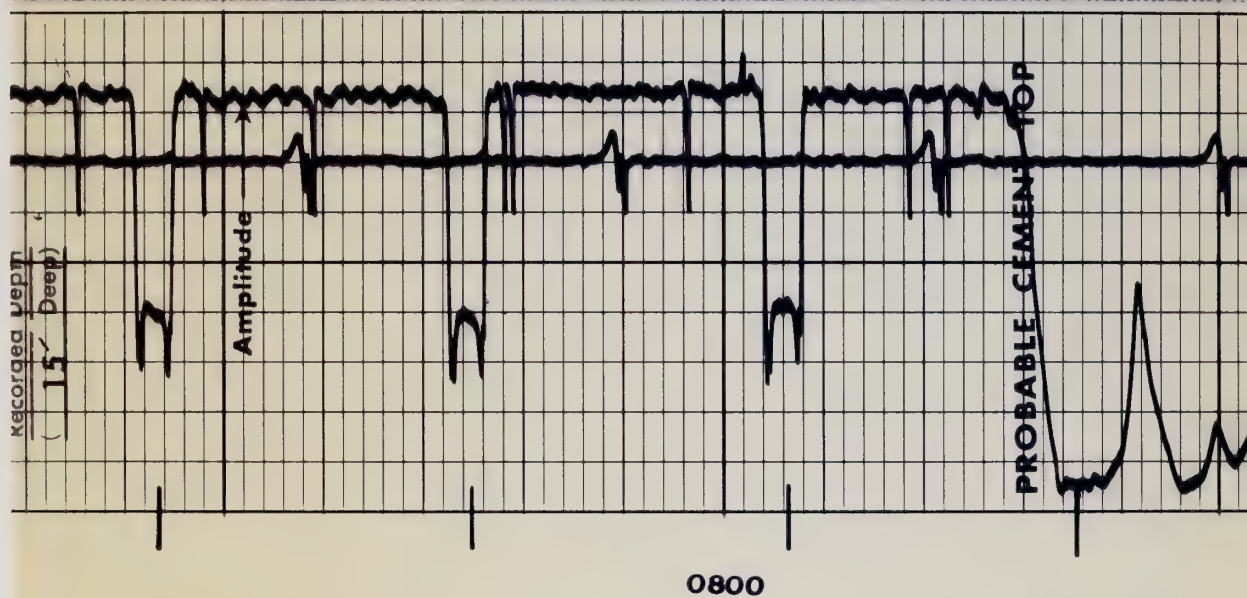
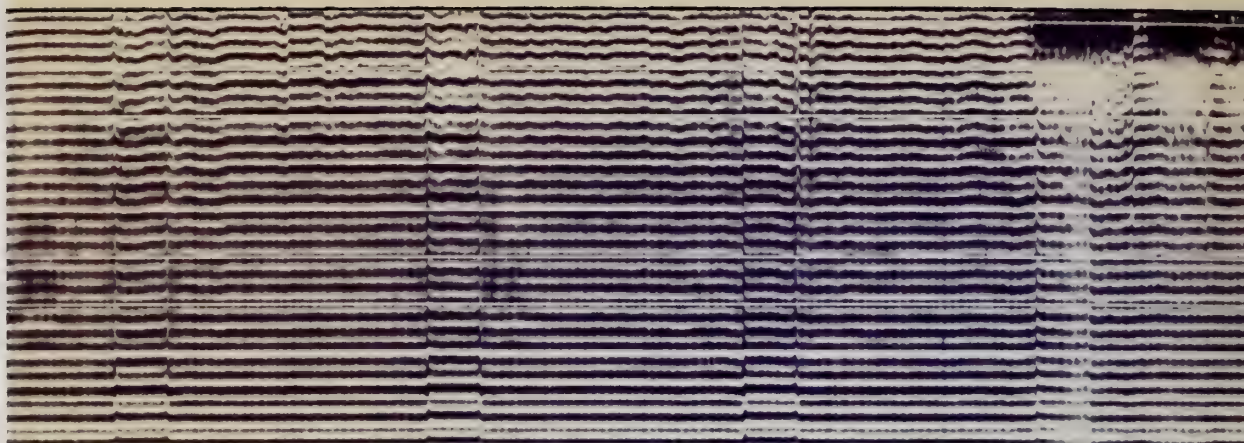
SQUEEZE JOB DETAIL			EQUIPMENT DATA		Centralizer Depths	Scratcher Depths
Squeeze number	1	2	Sonic Panel No.		SLP-FH #37	
Date			Sonic Cart No.		SLC-JD #83	
Depth interval			Sonic Sonde No.		SLS-JC #81	
Type cement			CRP No.		14	
Volume of cement			Mem Panel No.		----	
Additive			GR Panel No.		----	
Retarder			GR Cart No.		----	
Weight of slurry			Centralizer: Type		CME-V	CAI-AJ
Preceding fluid			No.		CME-W	
Breakdown pressure			To Level (MV)		100	
Max. pressure-stage 1			Cart. Gain		1/20	
" " " 2			CRP Intensity		1	
" " " 3			R9G Intensity		7 3/4	
Final maximum pressure						
Started pumping cement			Logging Speed		30 FPM	
Released pressure			Time Constant			
Start CBL						
Finish CBL						
AVERAGE WELL DRIFT:						
° from	° from	° from	to	to	to	to

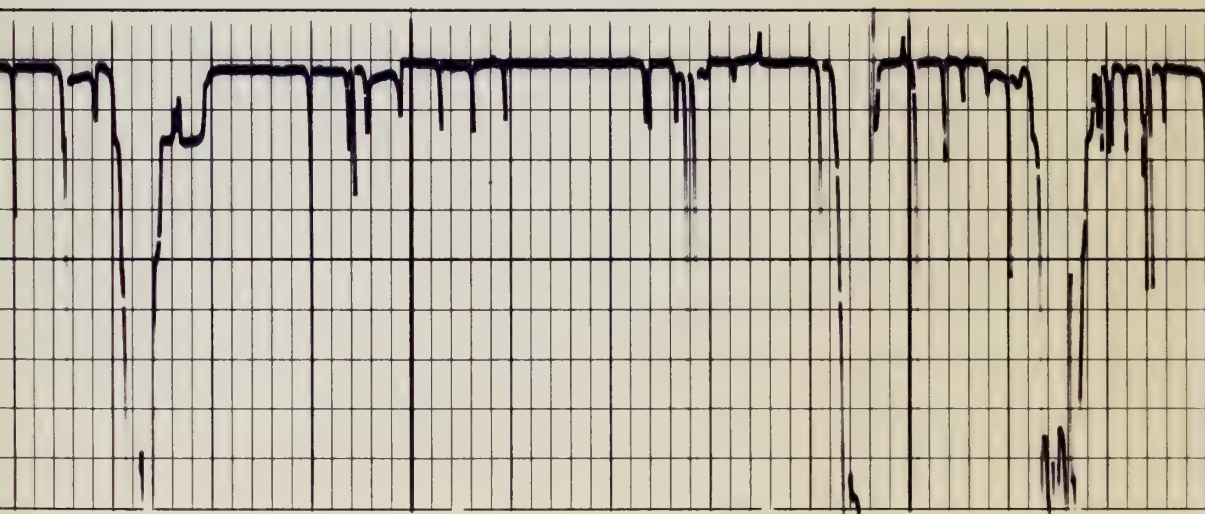
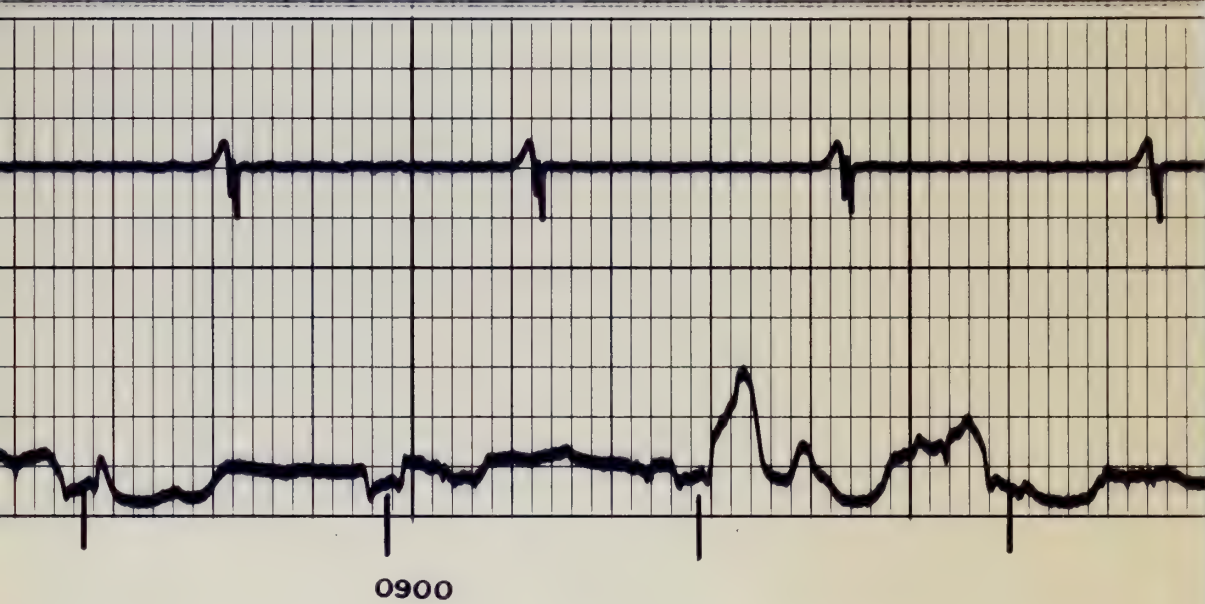
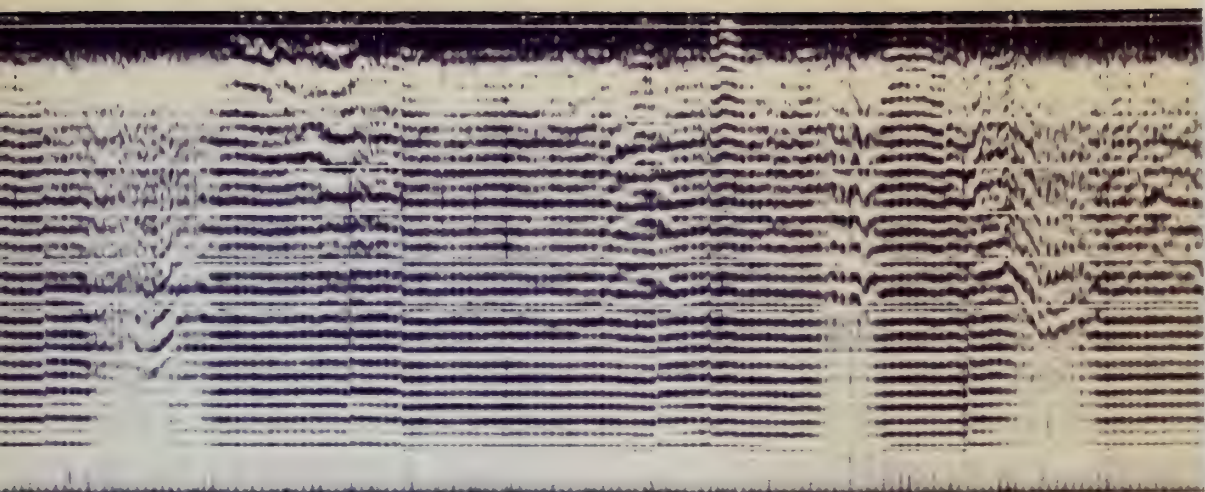
MICROSECONDS	SPACING
200	1200
MILLIVOLTS	
0	100
Casing Collars	
Corrected Depth	

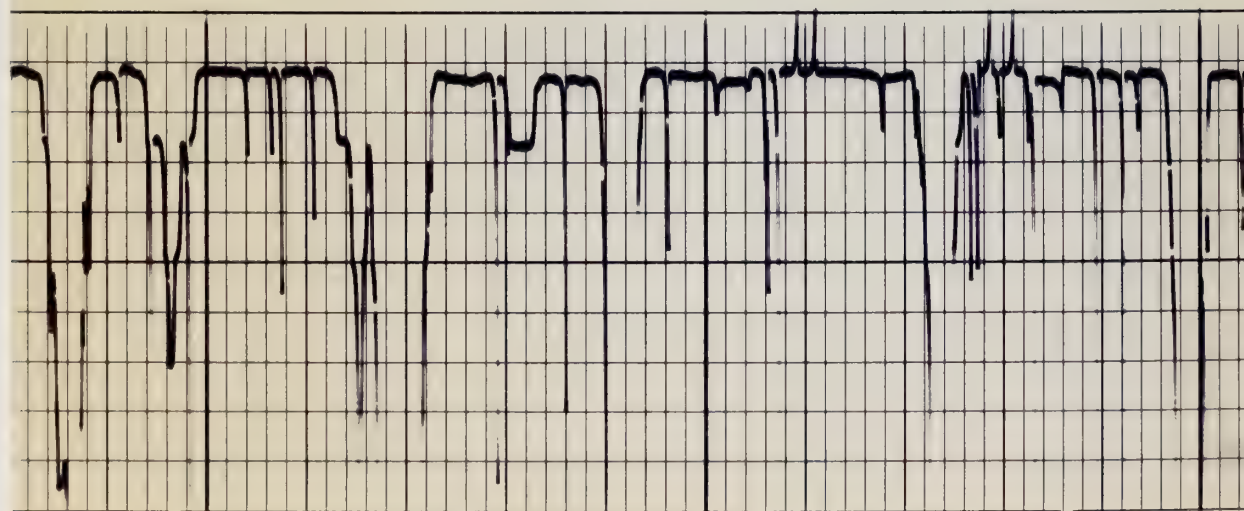
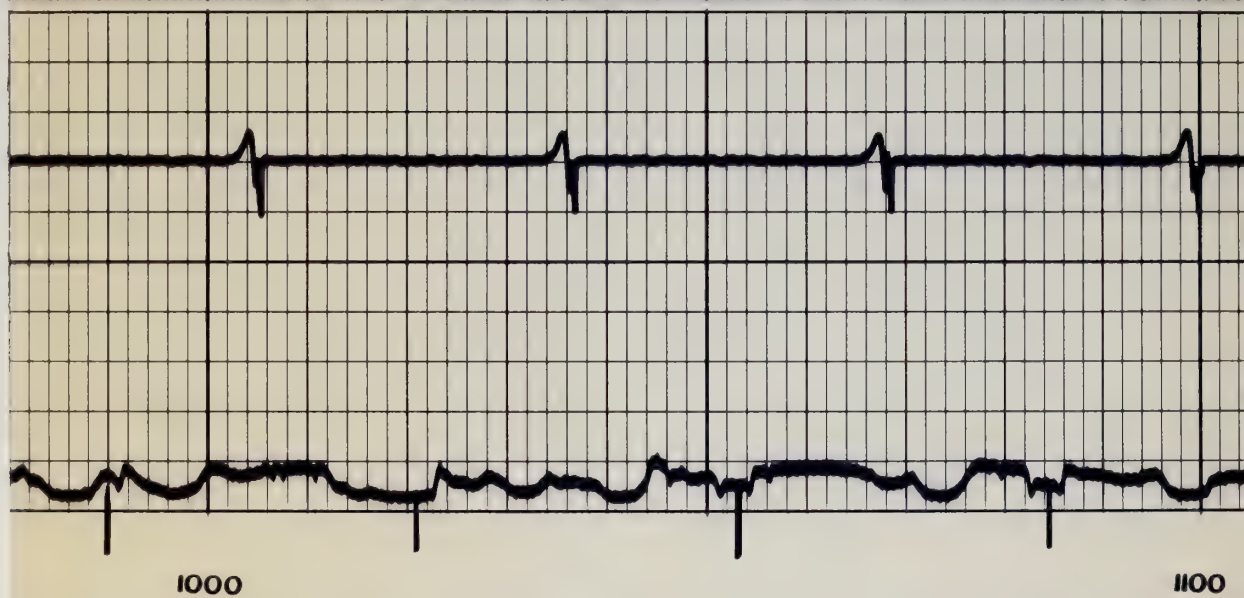
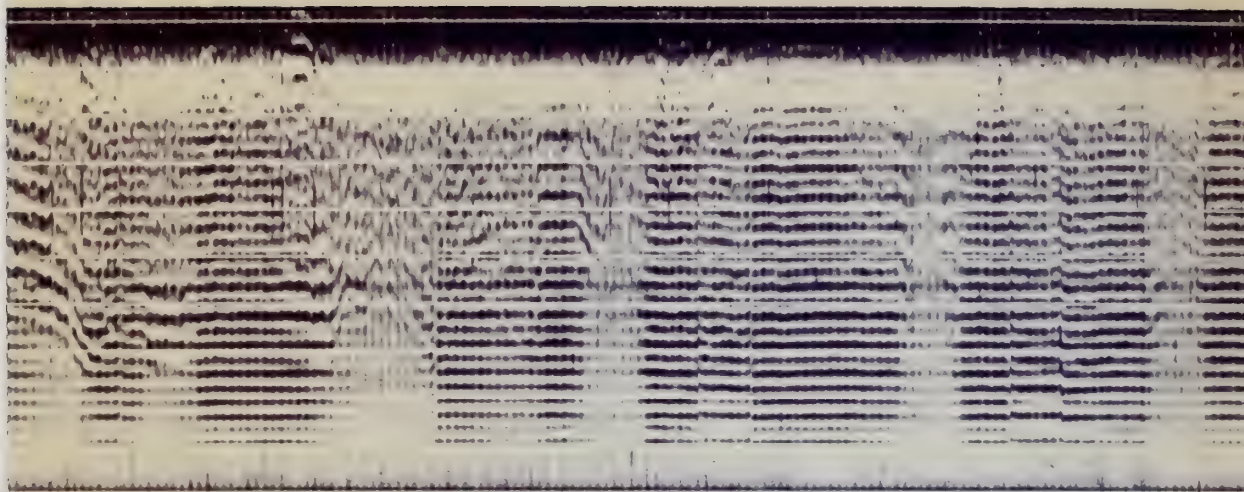
MICROSECONDS	SPACING
400	200

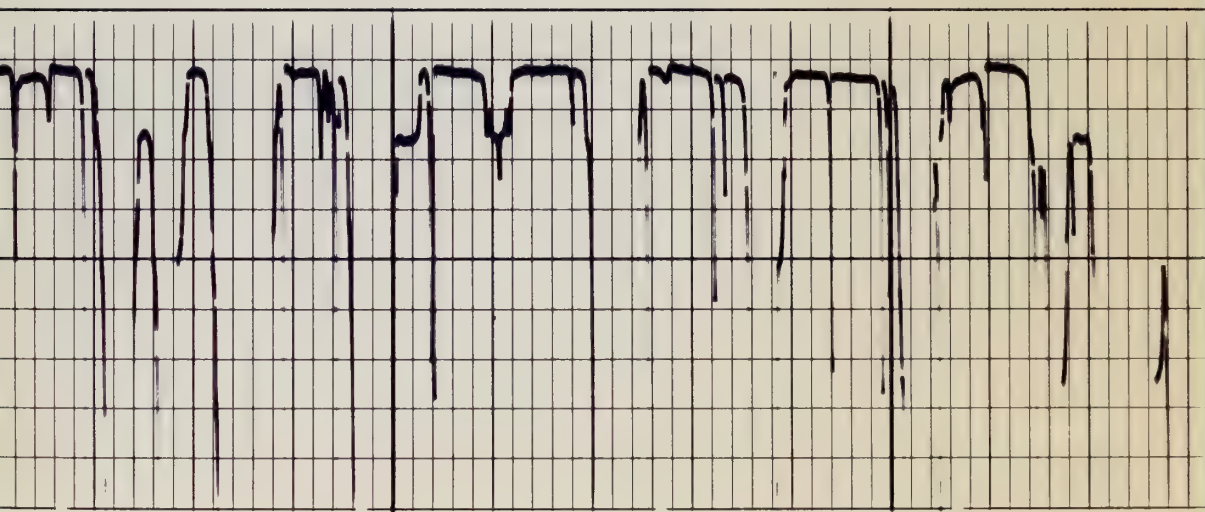
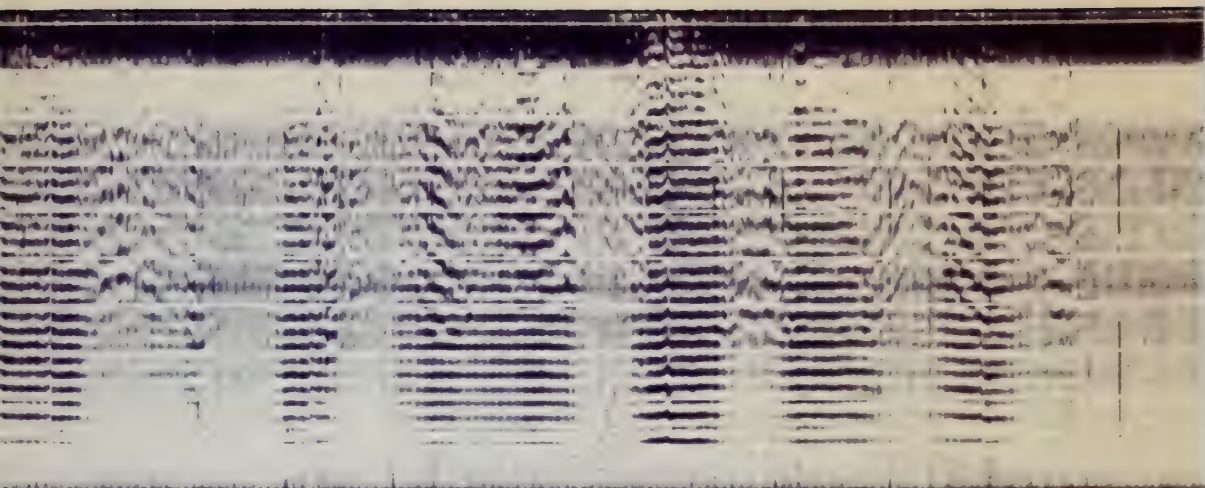


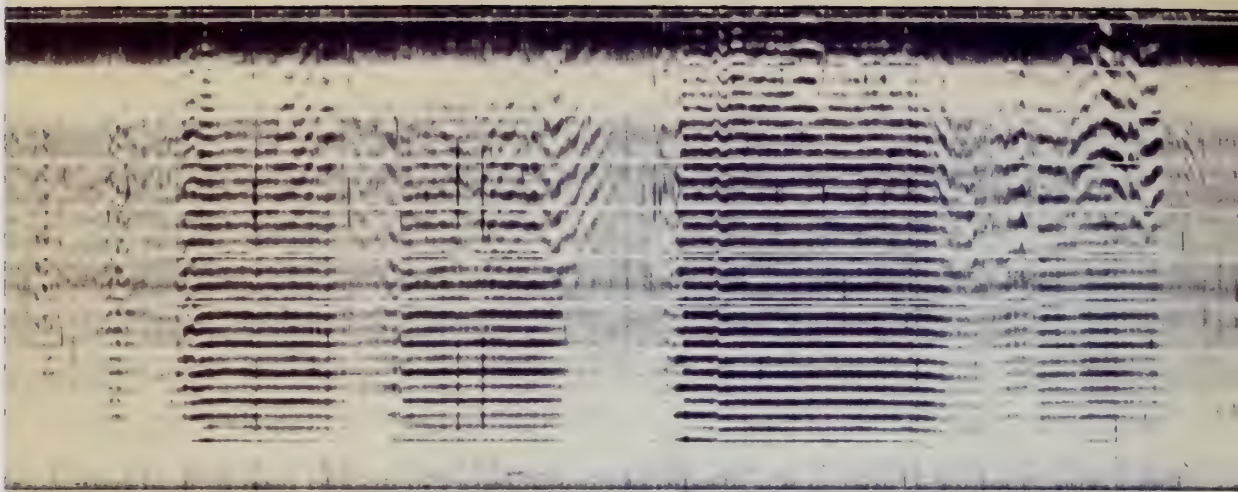
OUT



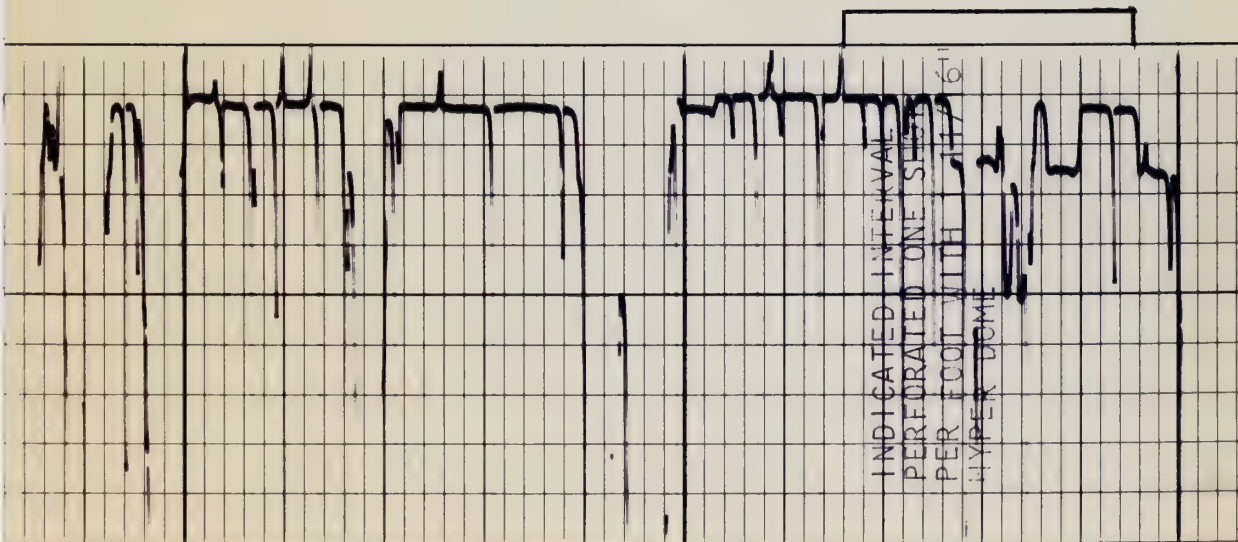


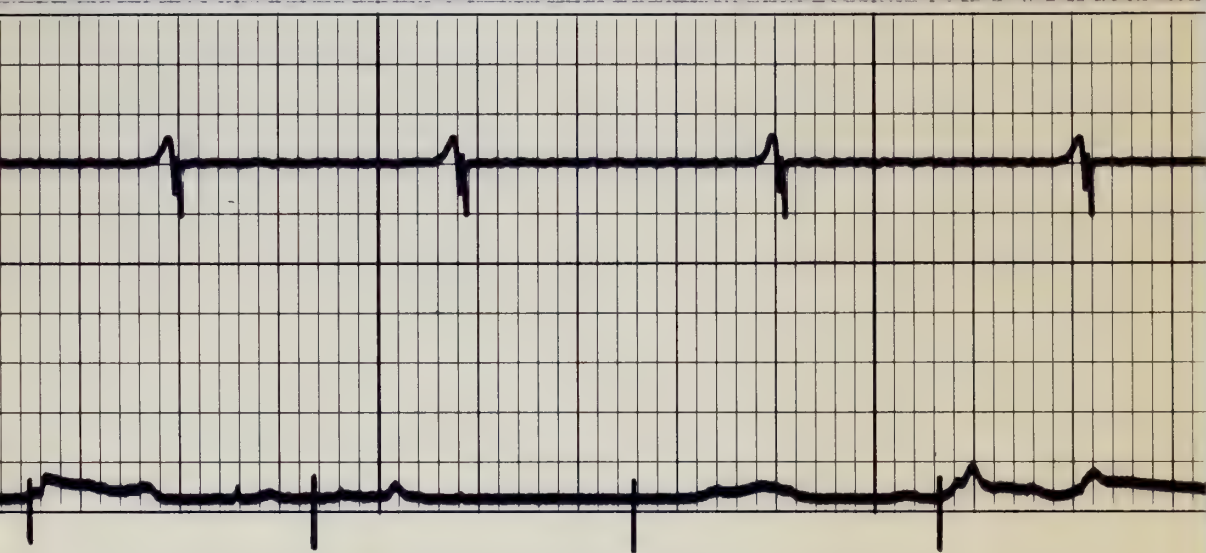
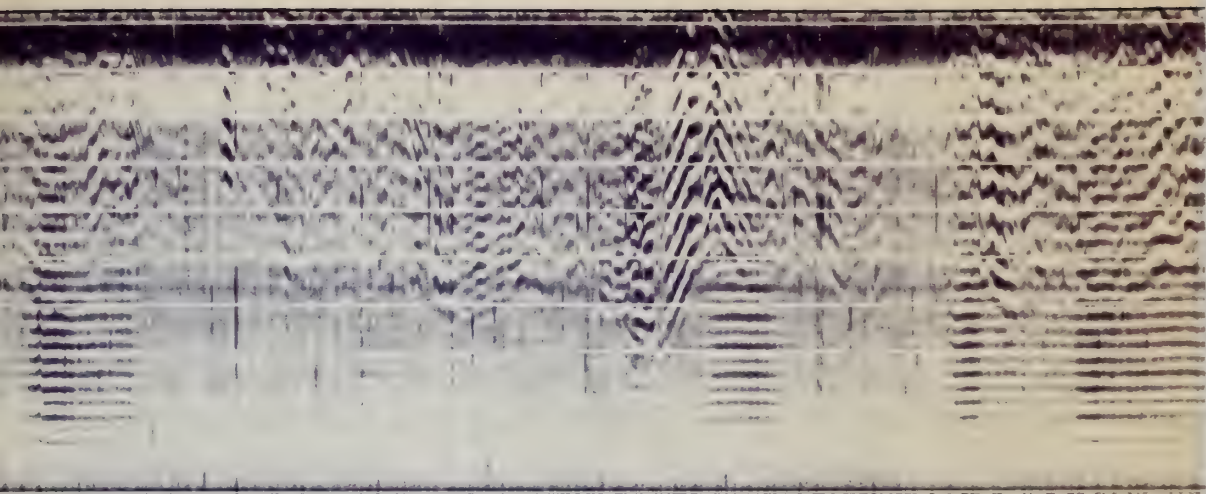




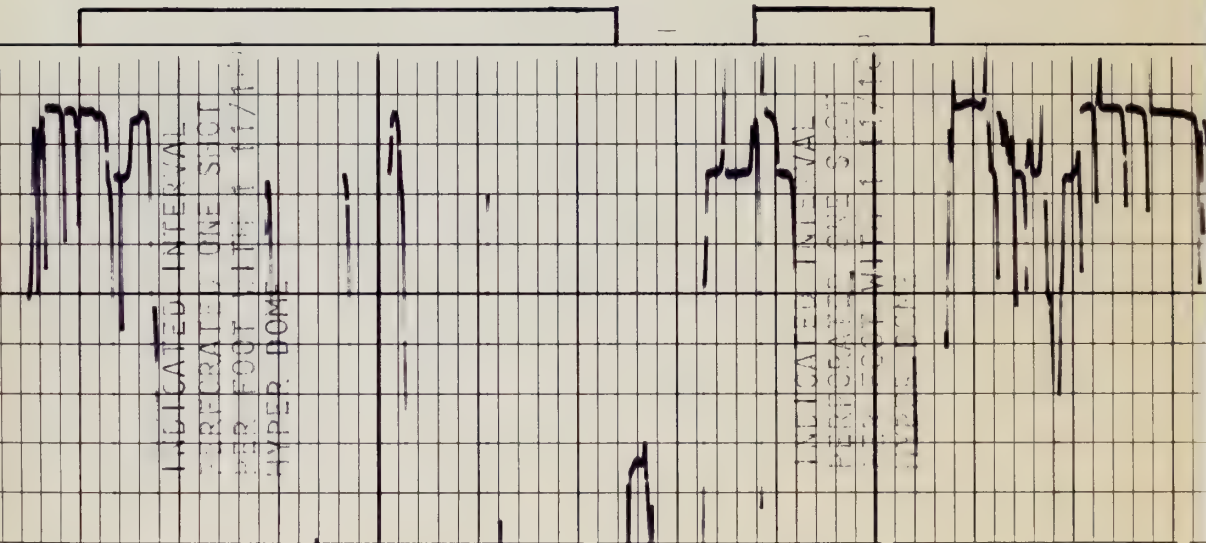


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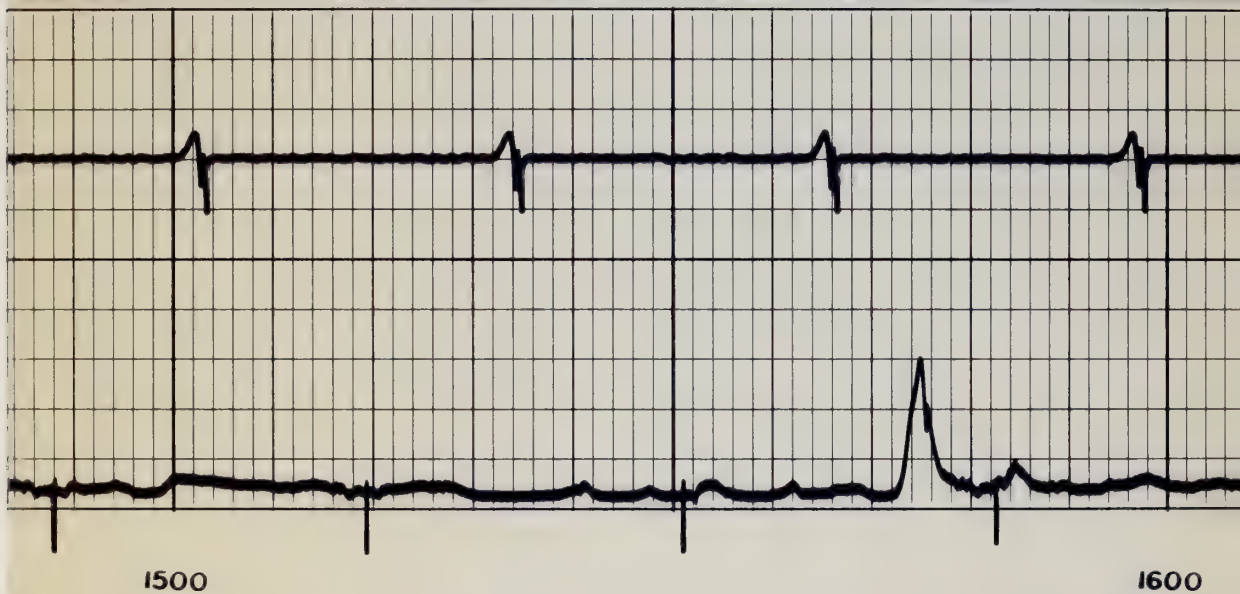
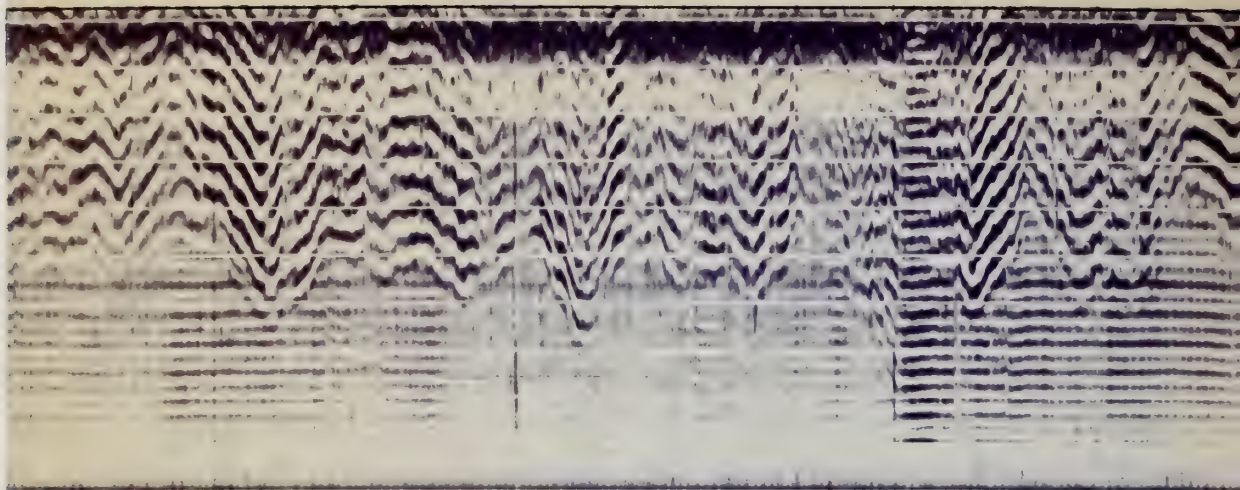


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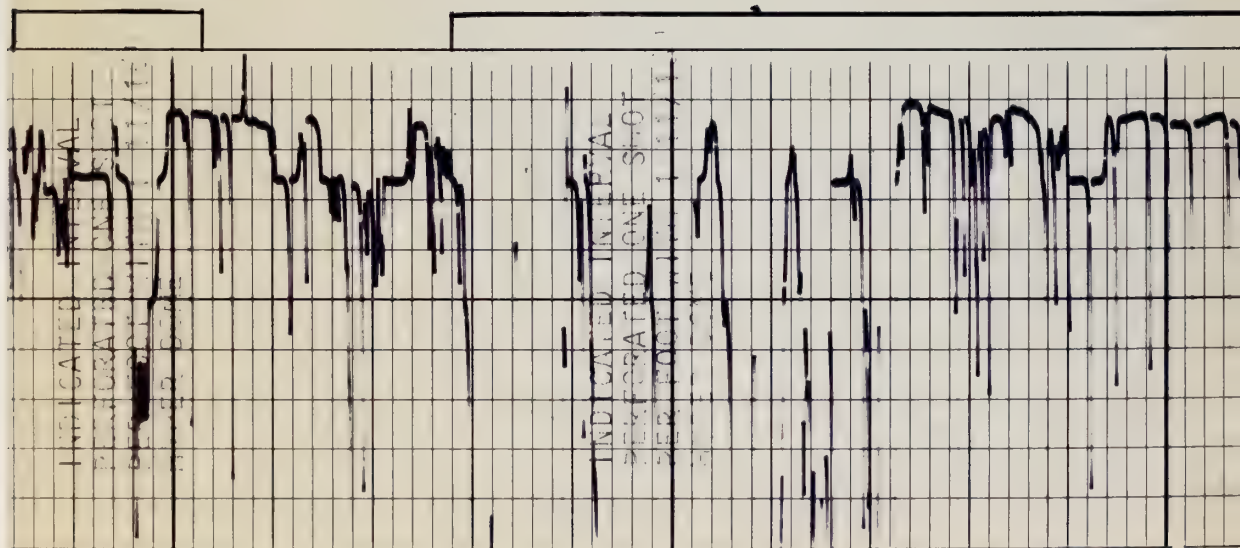
INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH 1 11/16
HYPER DOME

INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH 1 11/16
HYPER DOME



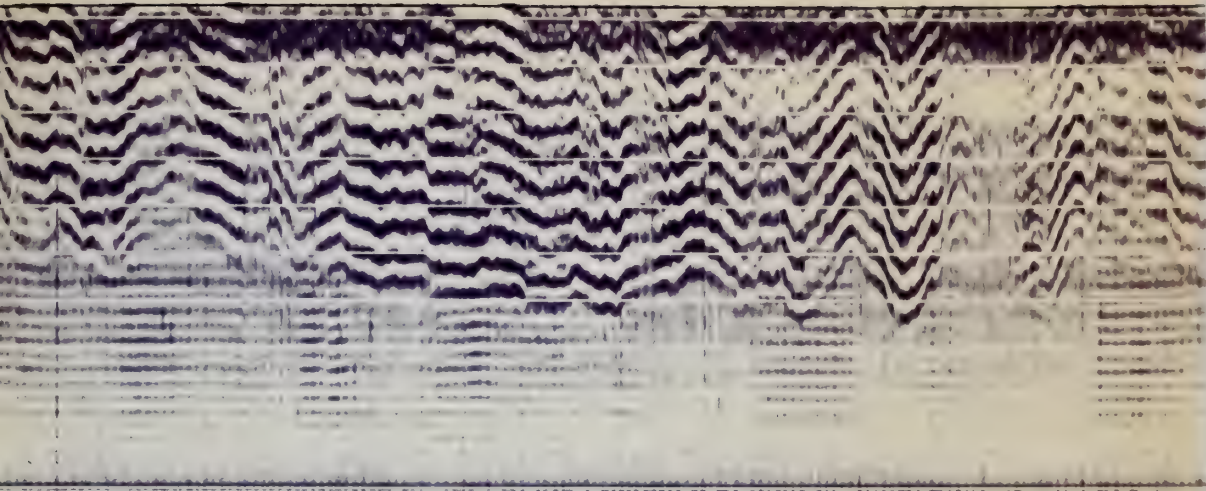
1500

1600

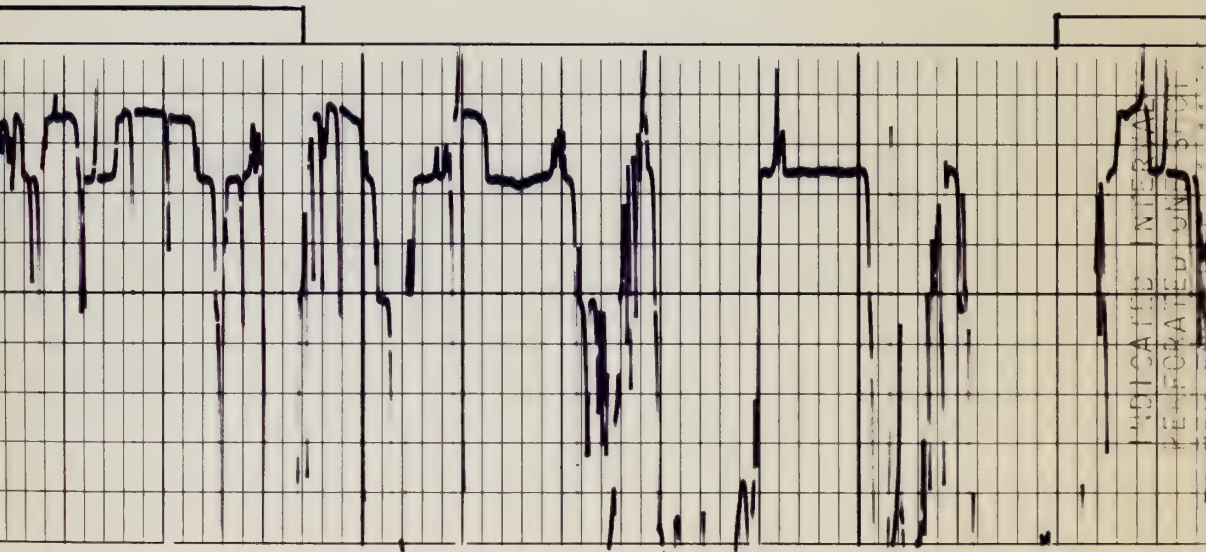


INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT 1.111

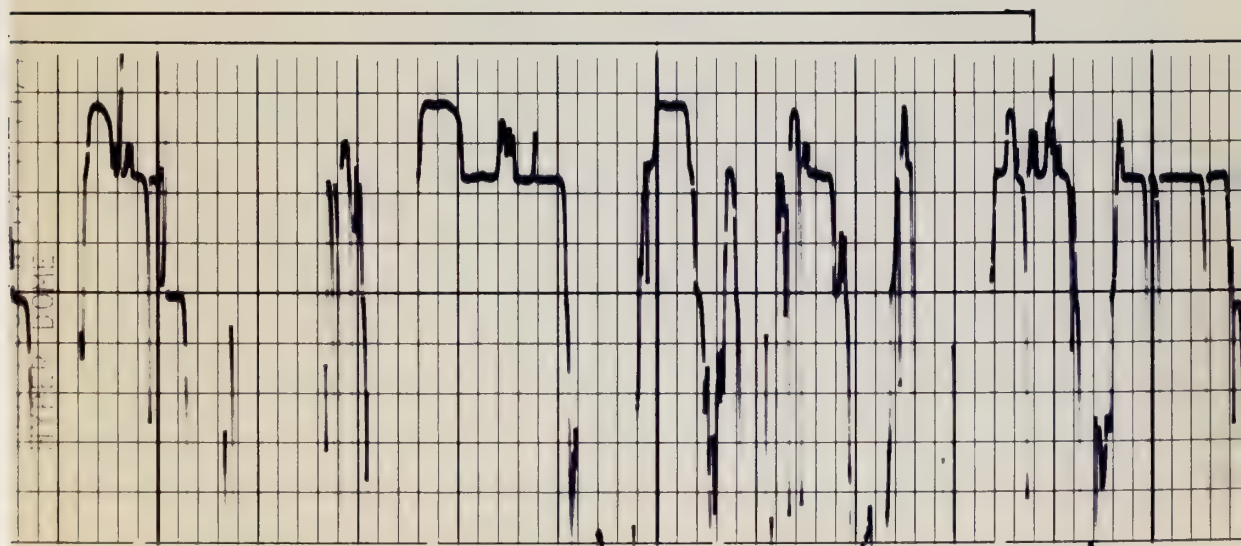
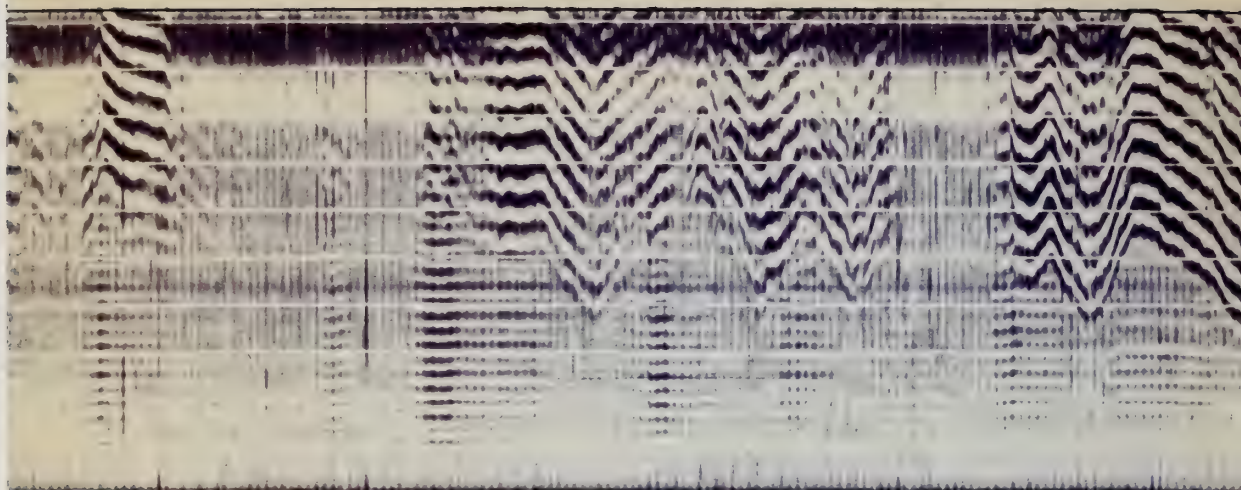
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PERFORATED ONE SHOT
PER FOOT 1.111

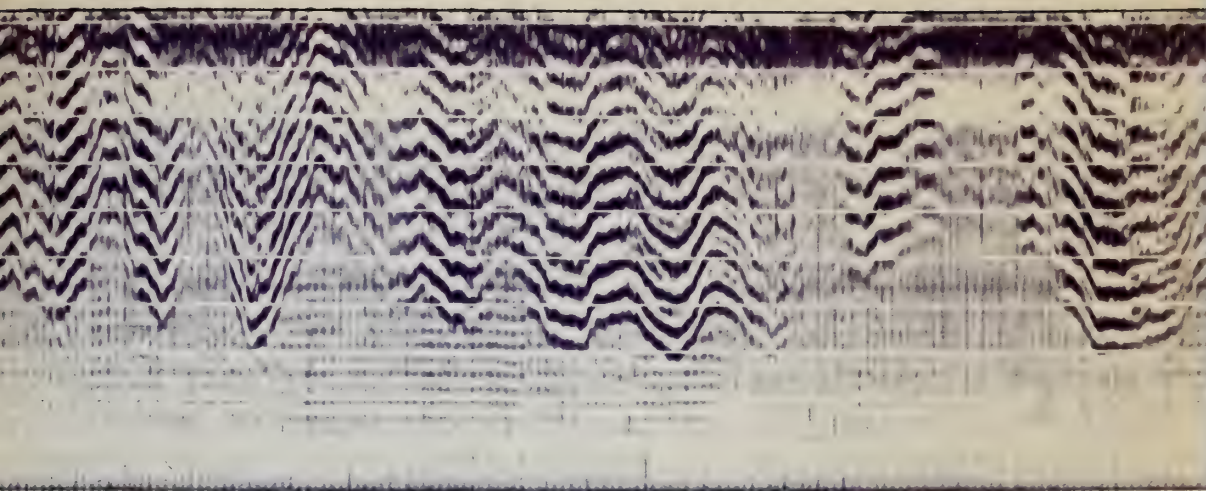


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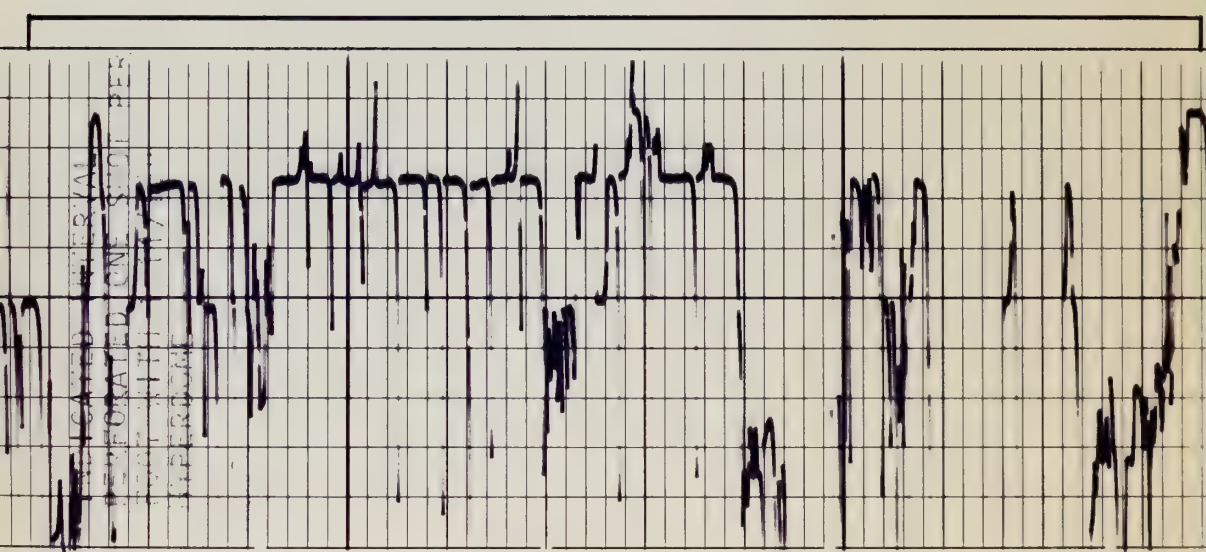


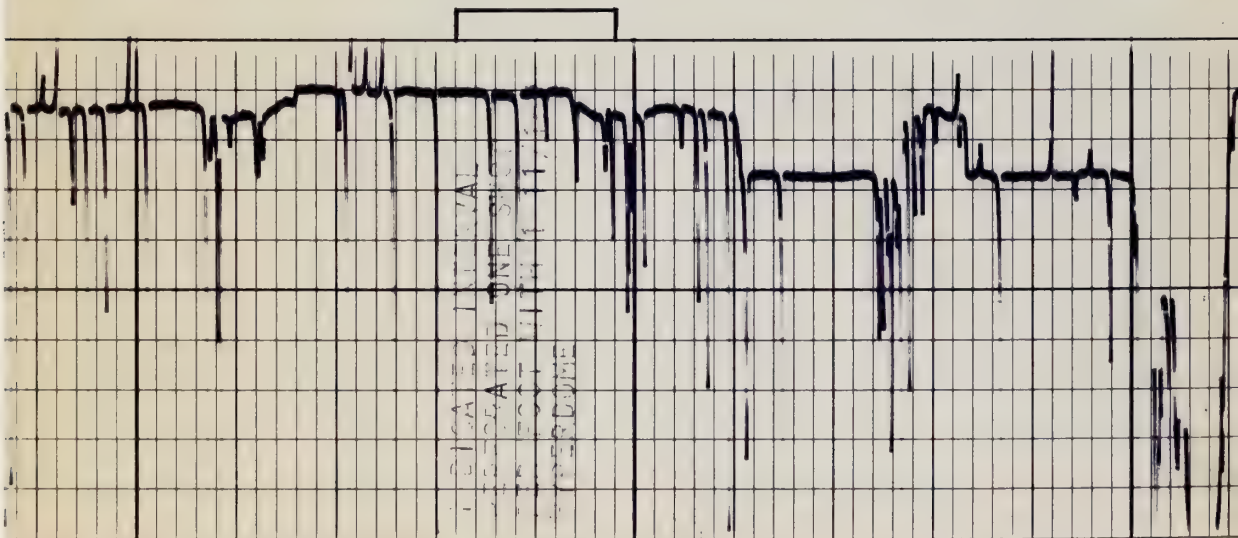
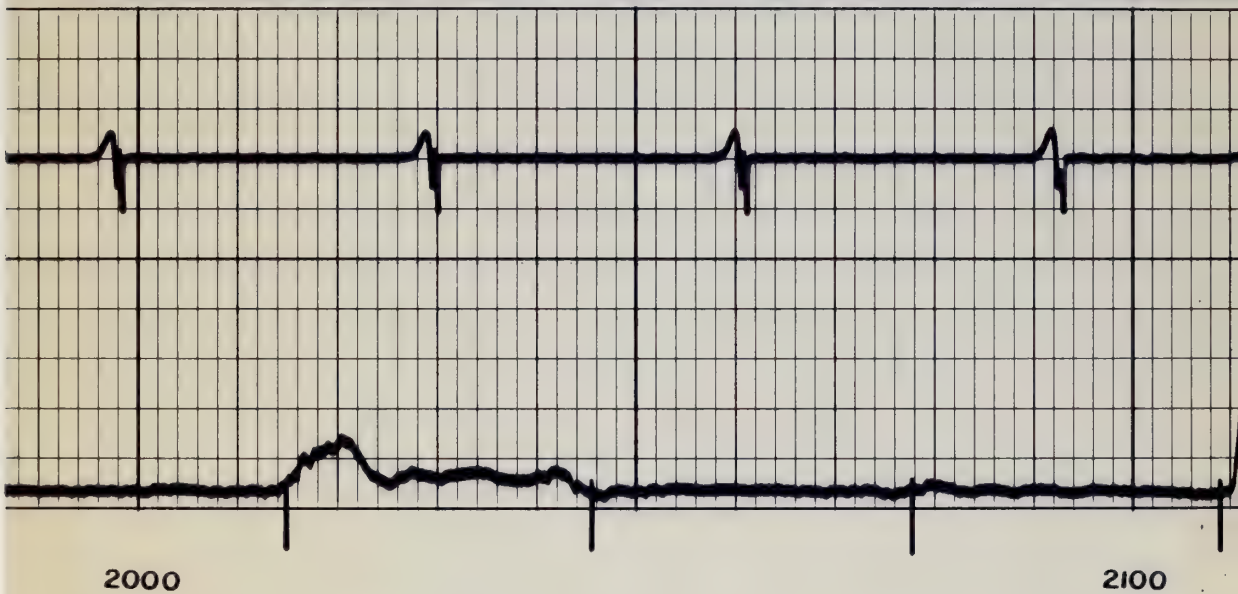
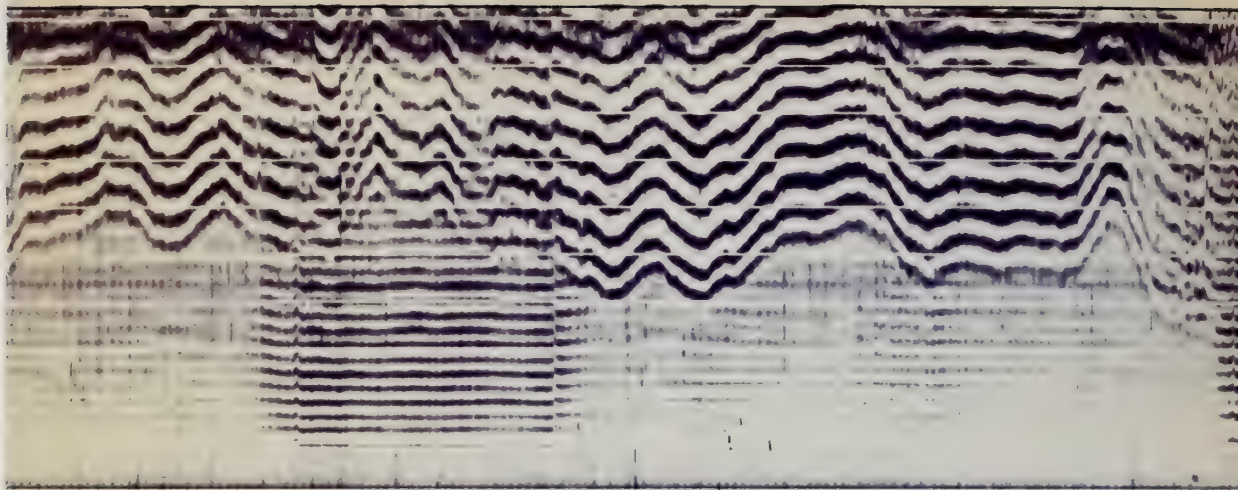
INDICATED INTERVAL
PERFORATED UNIT

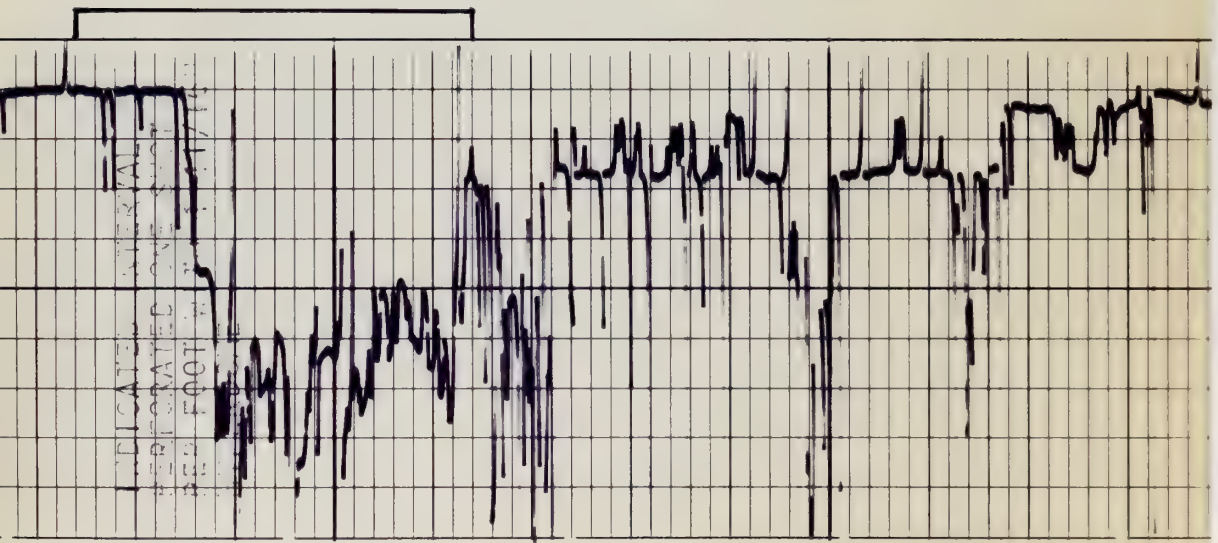
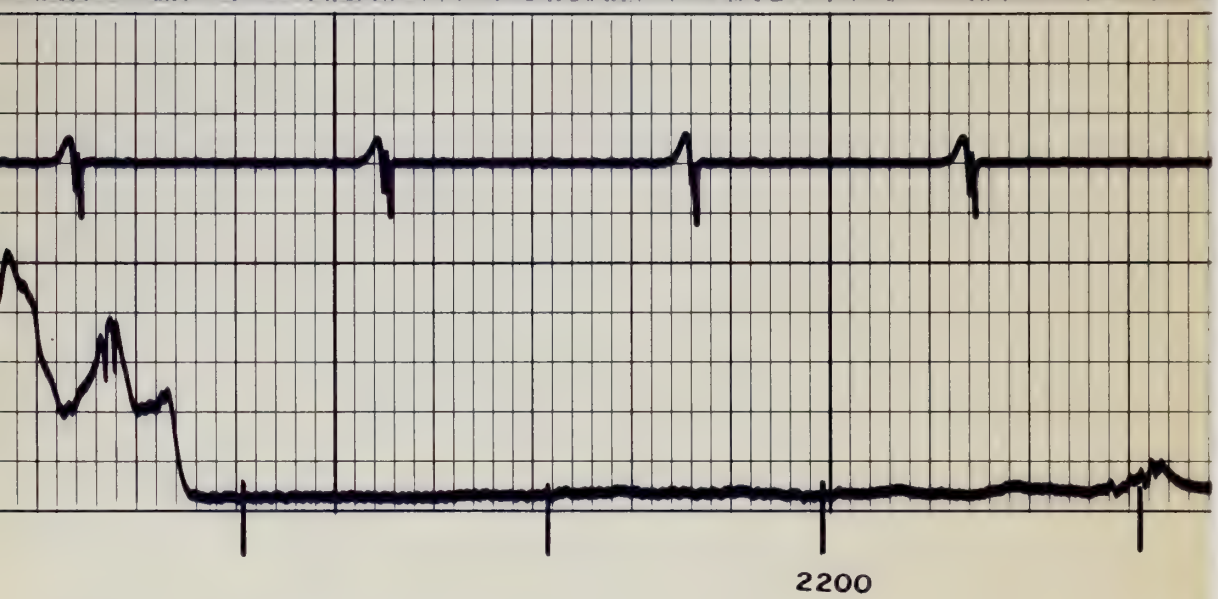
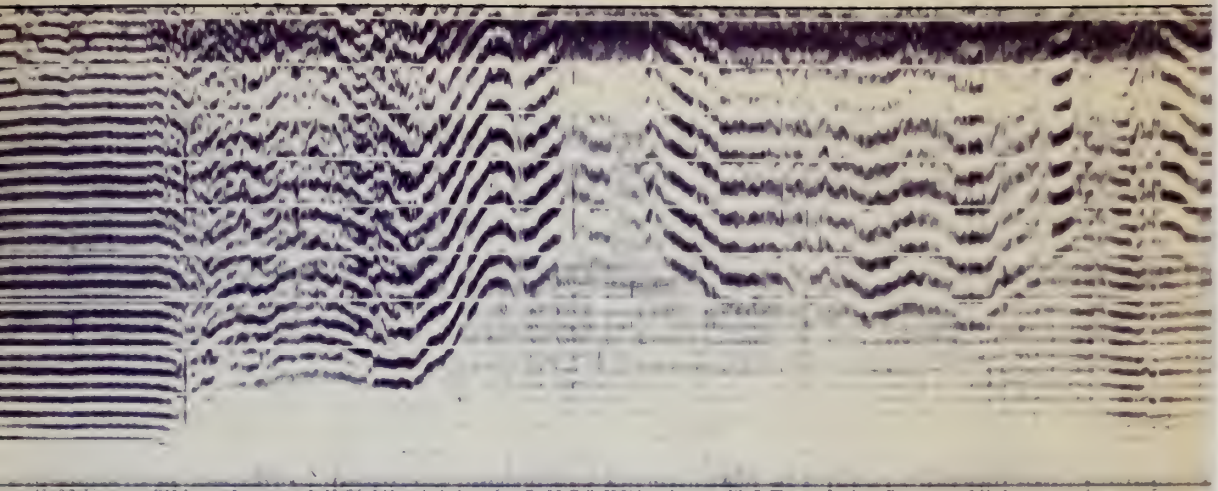


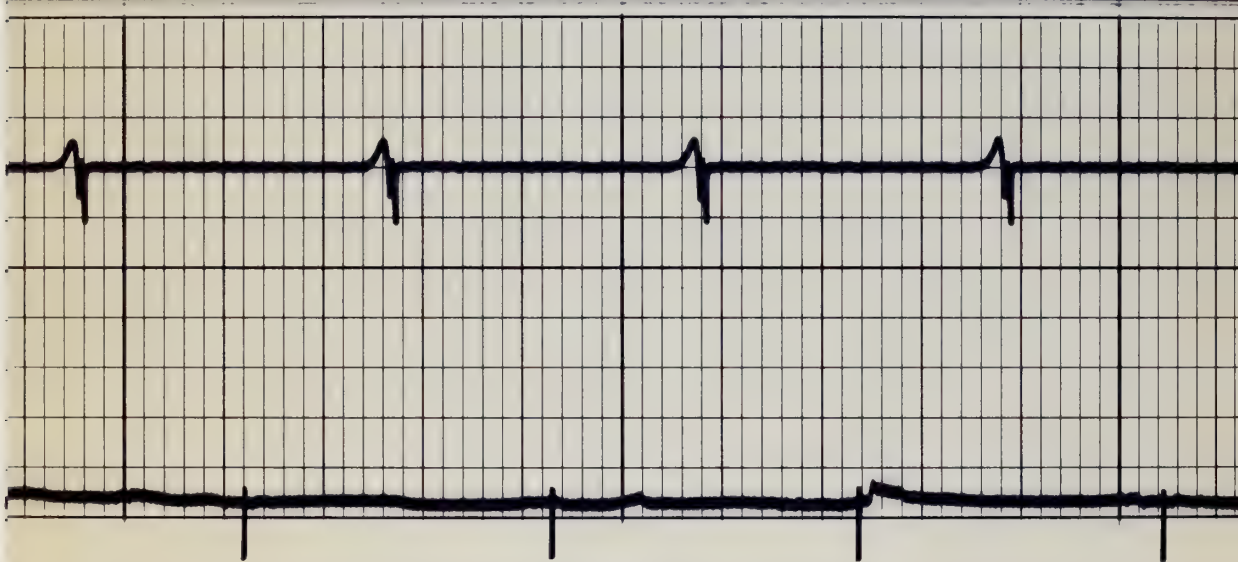
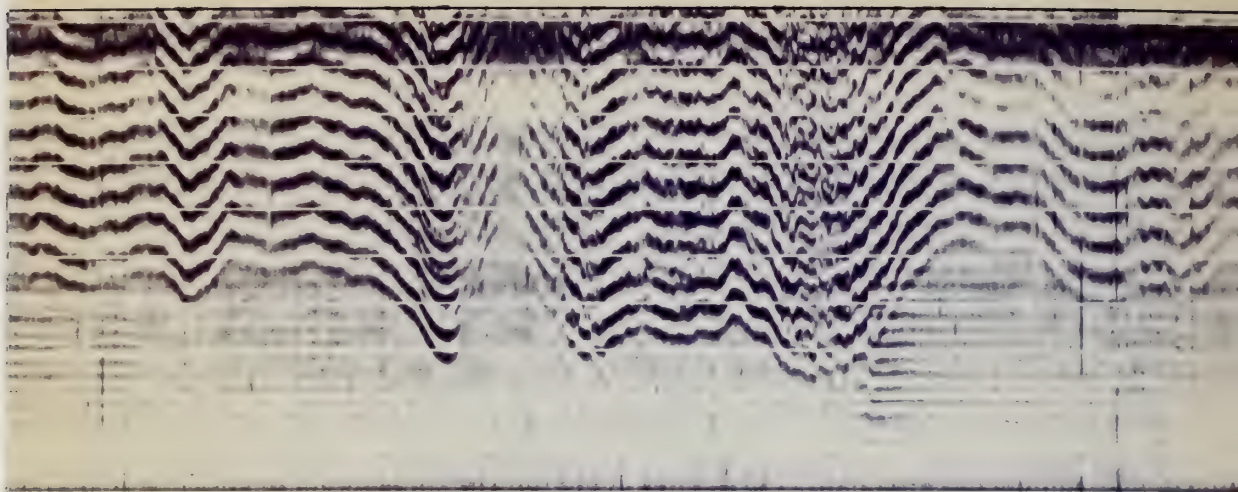


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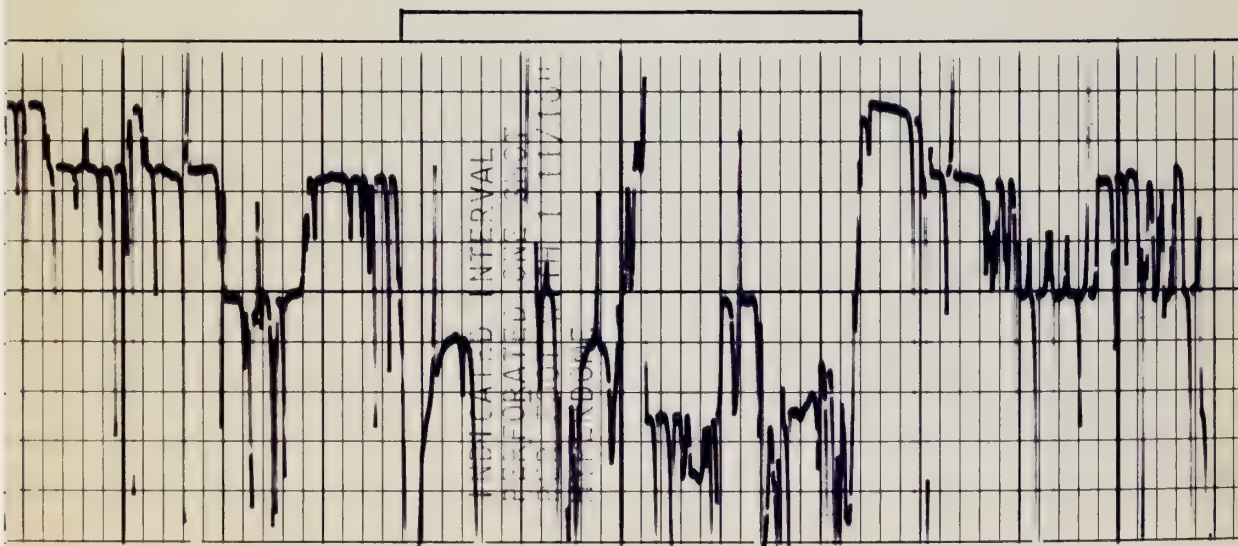


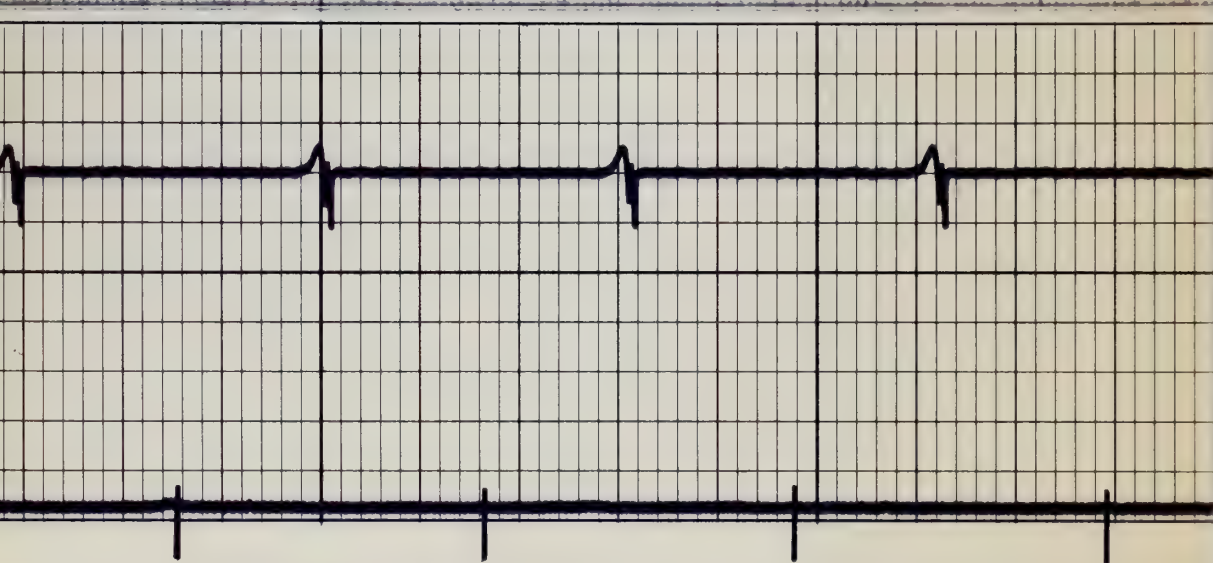
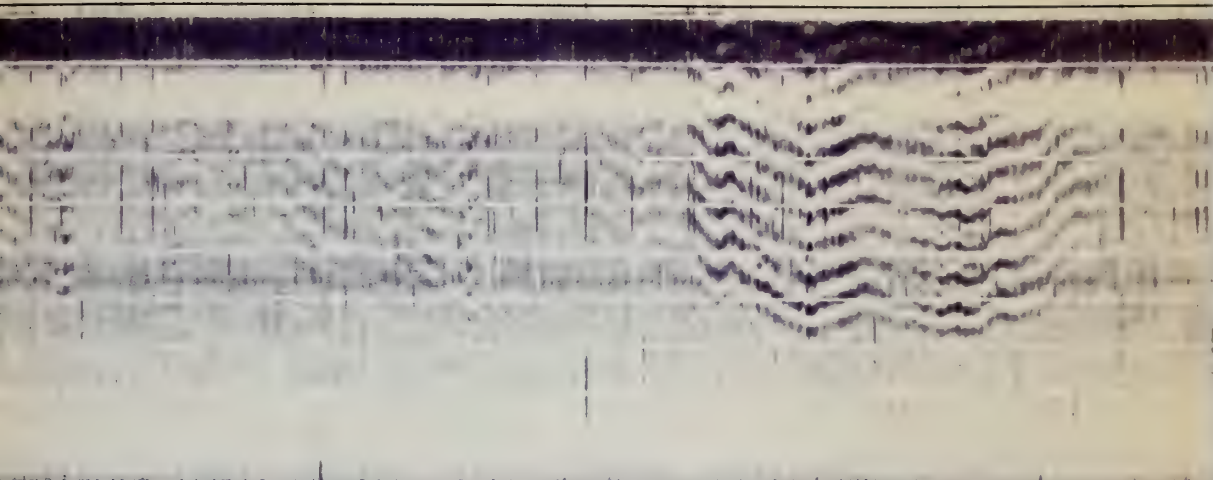




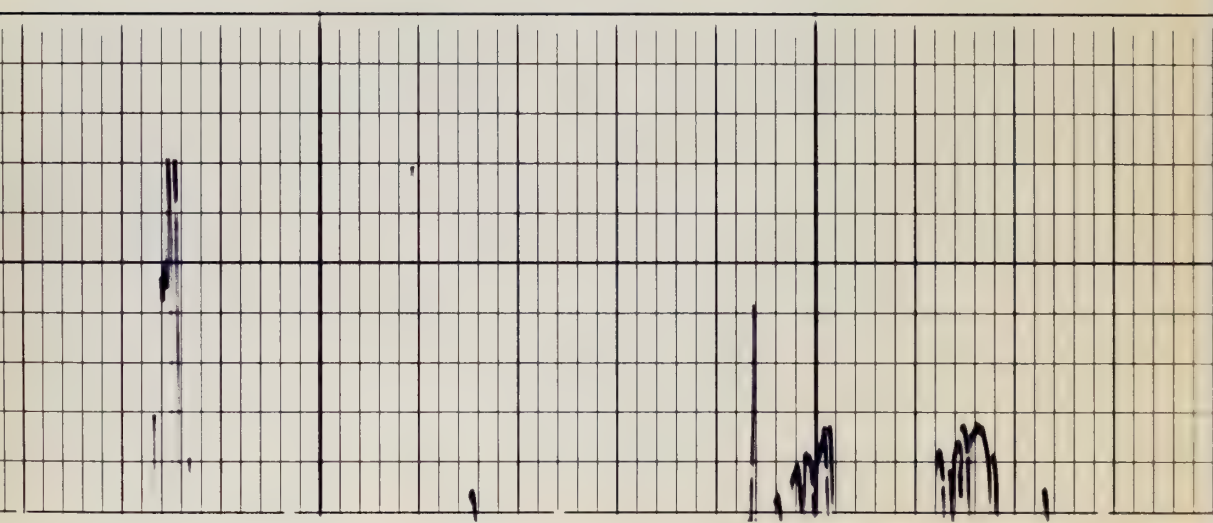


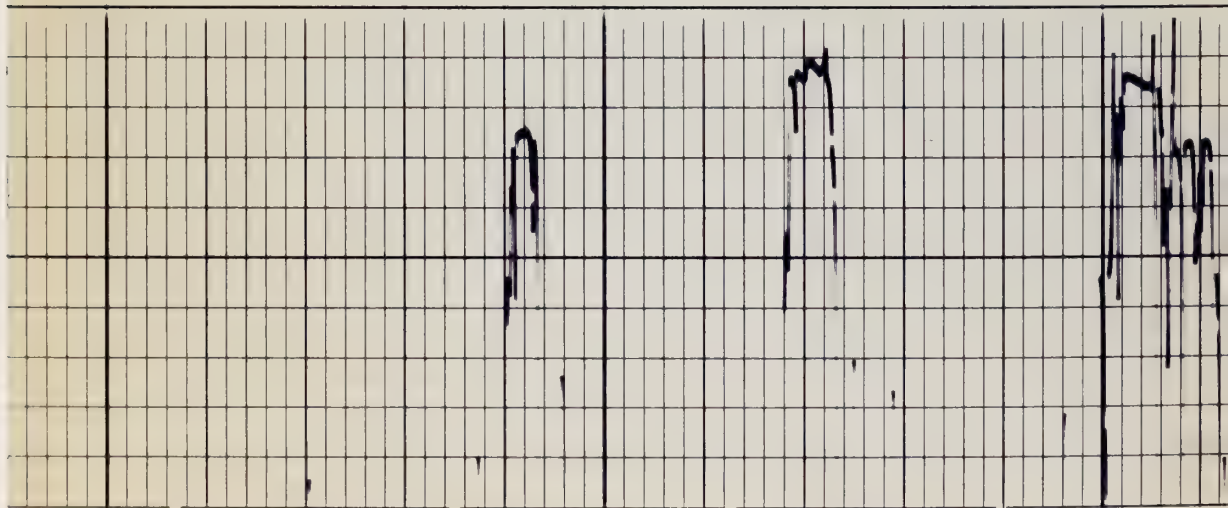
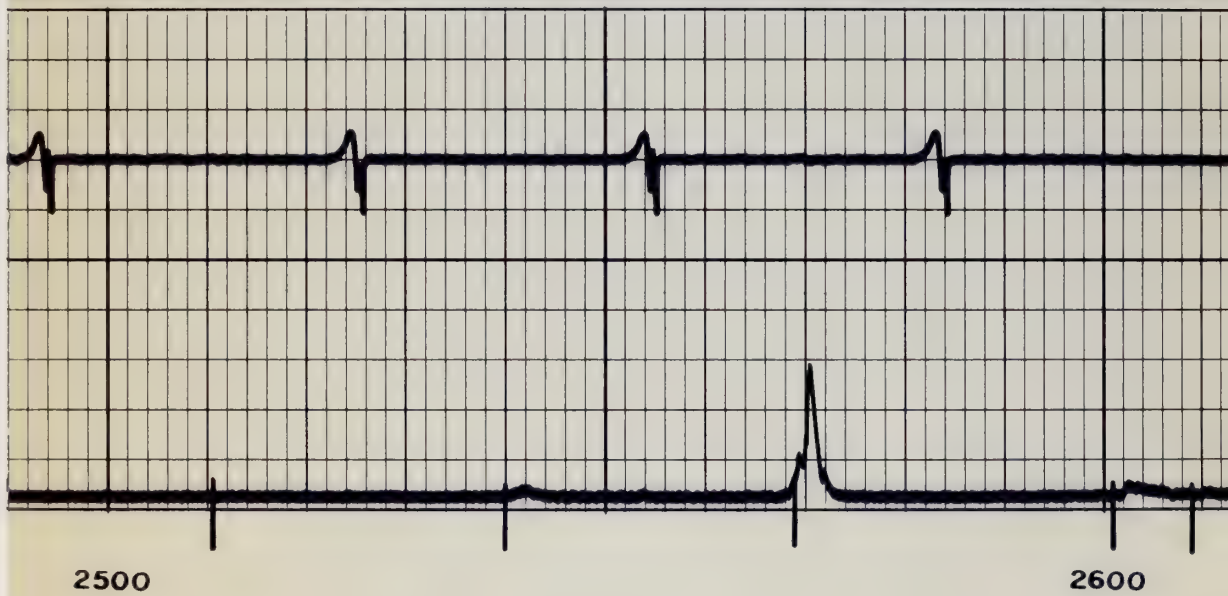
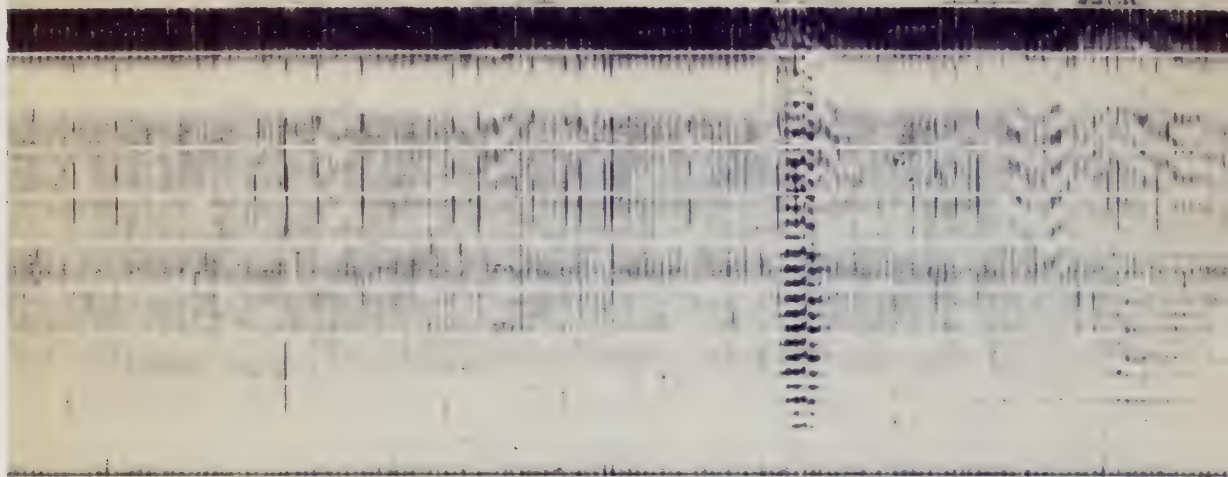
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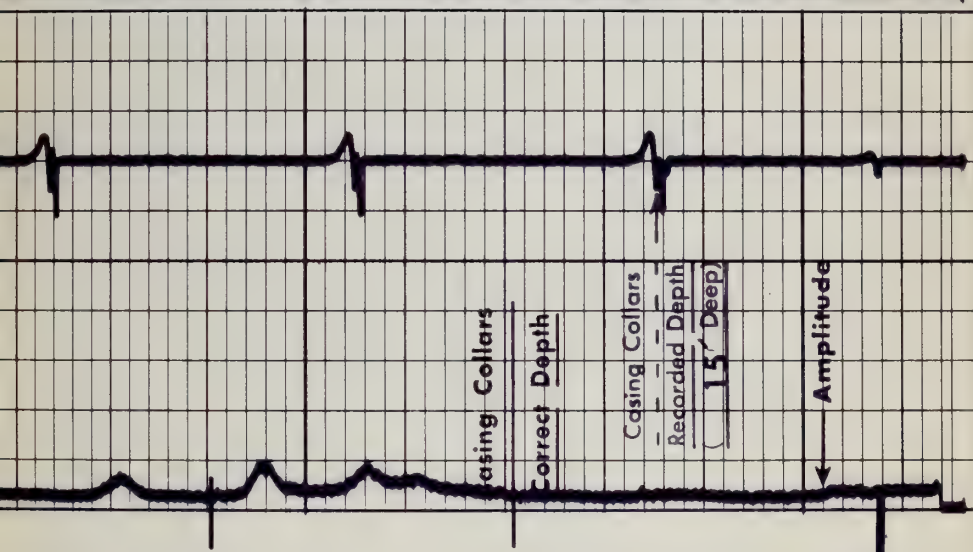
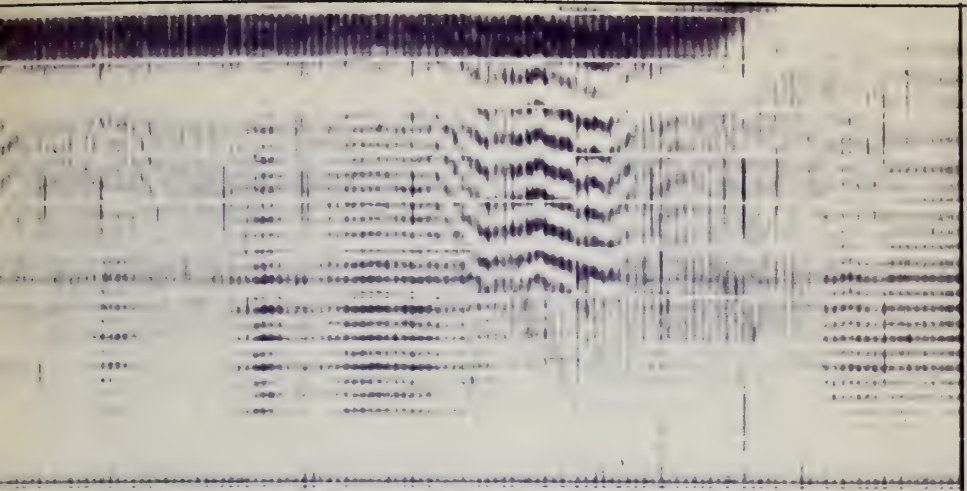




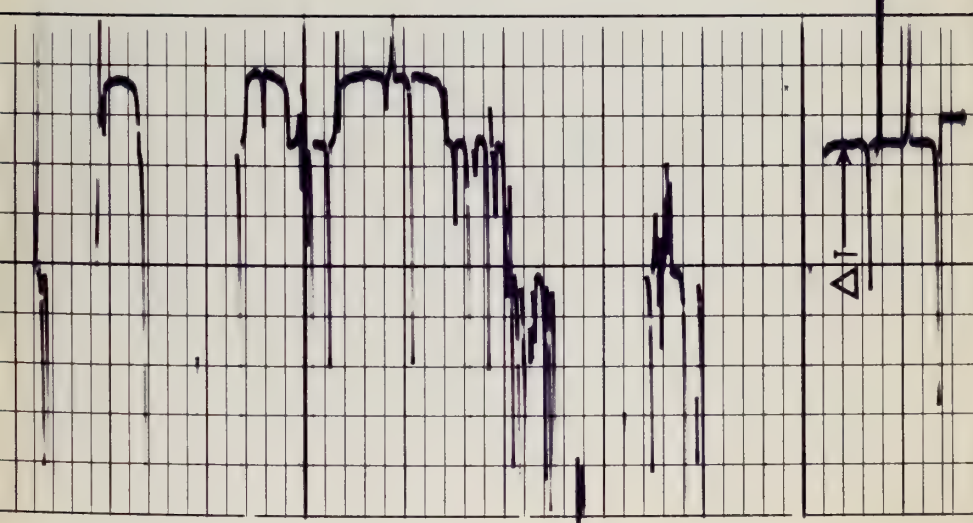
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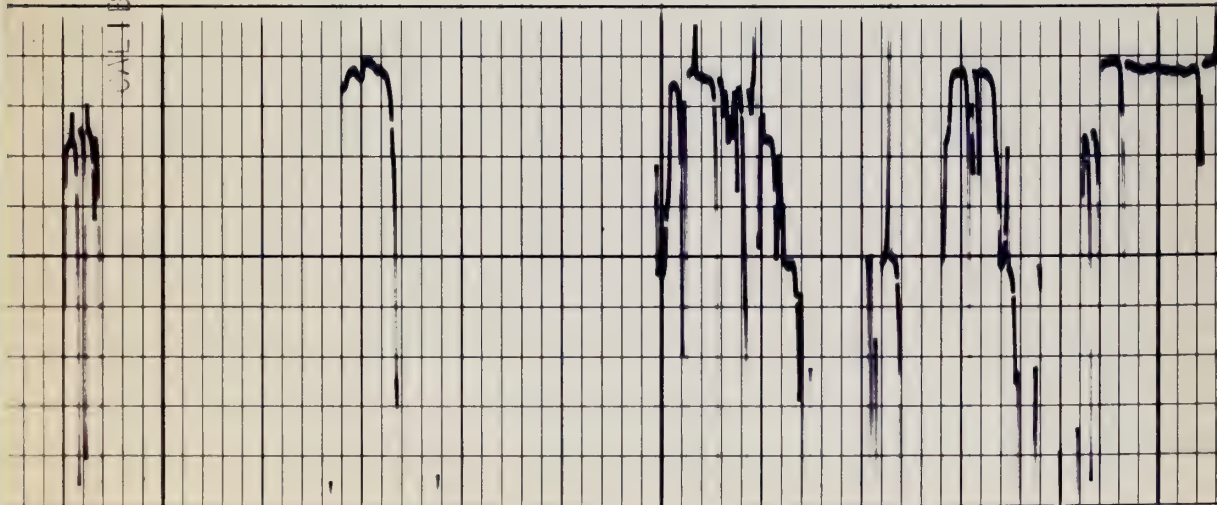
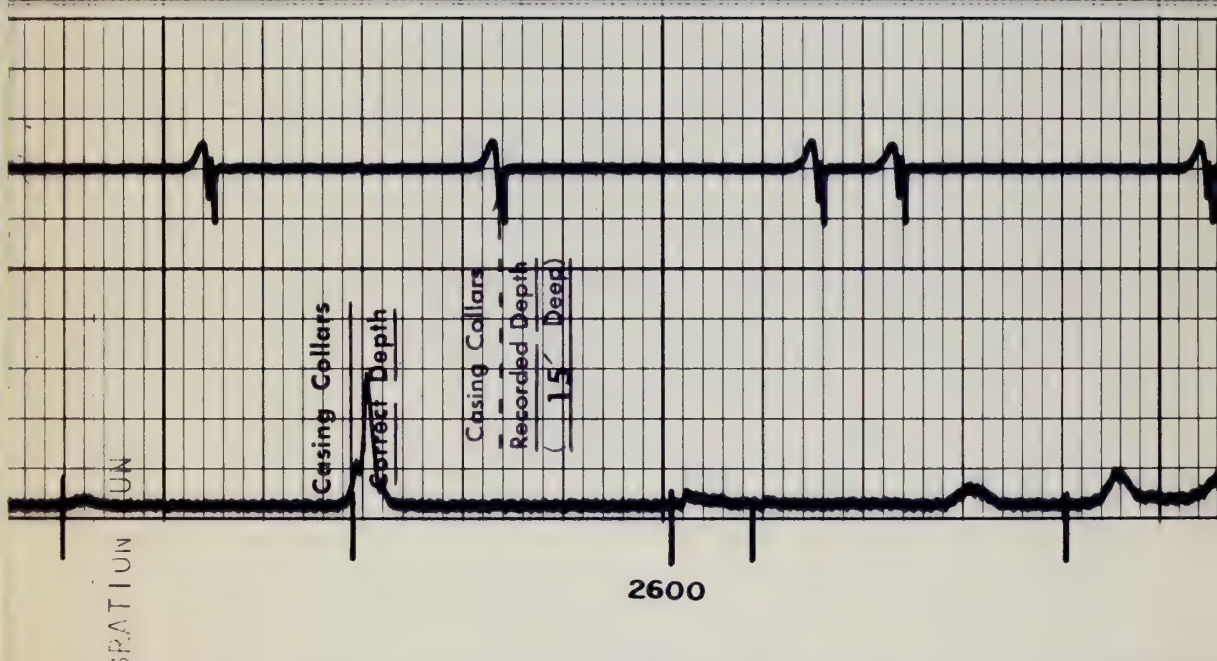
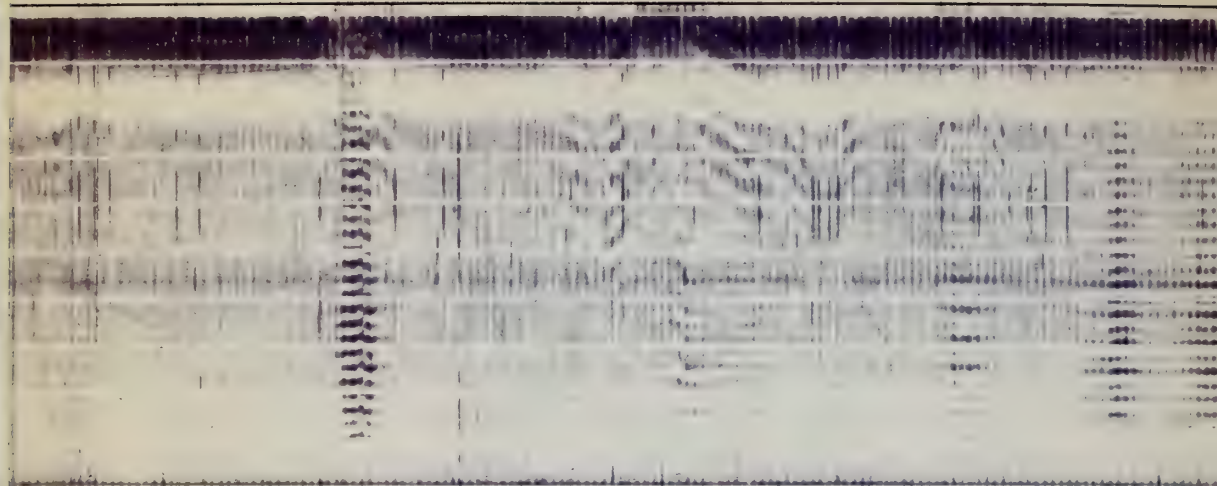


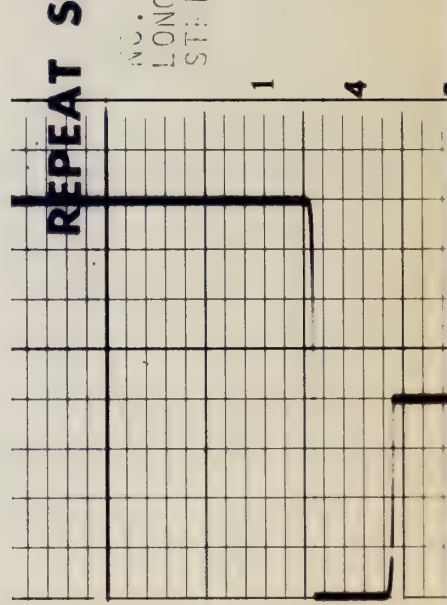
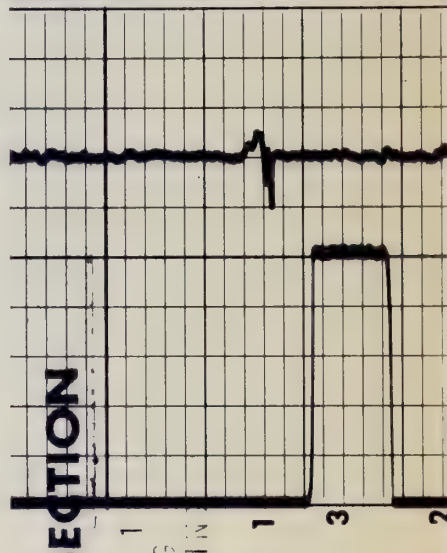
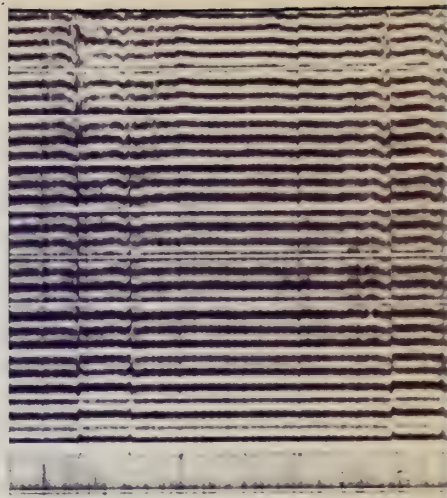
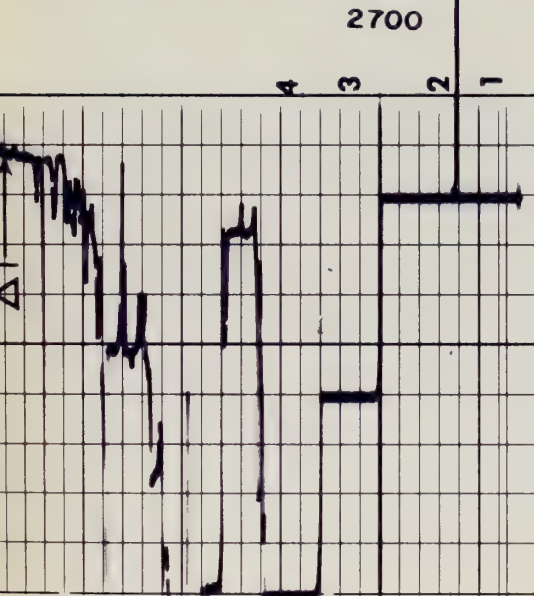
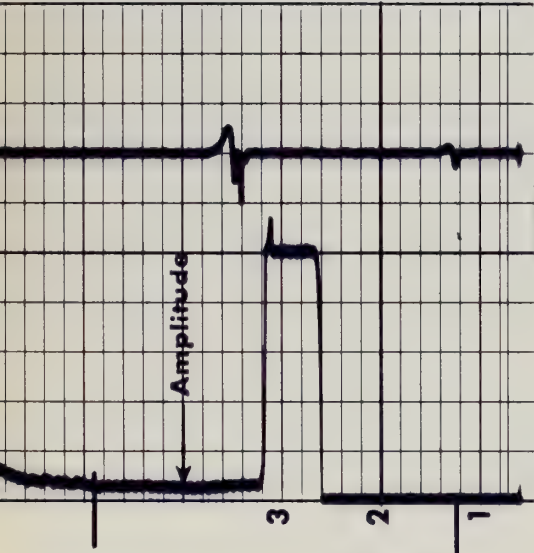
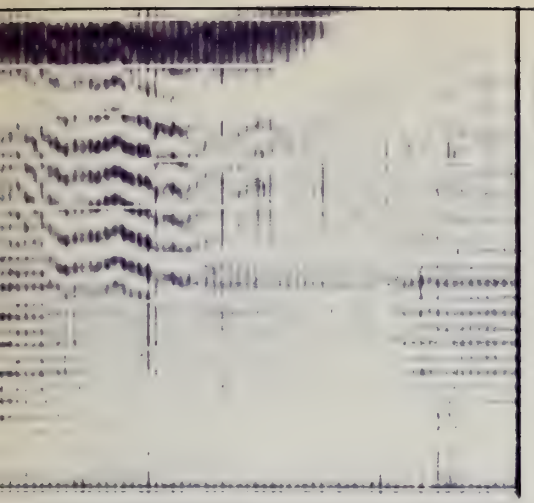




2700 FR

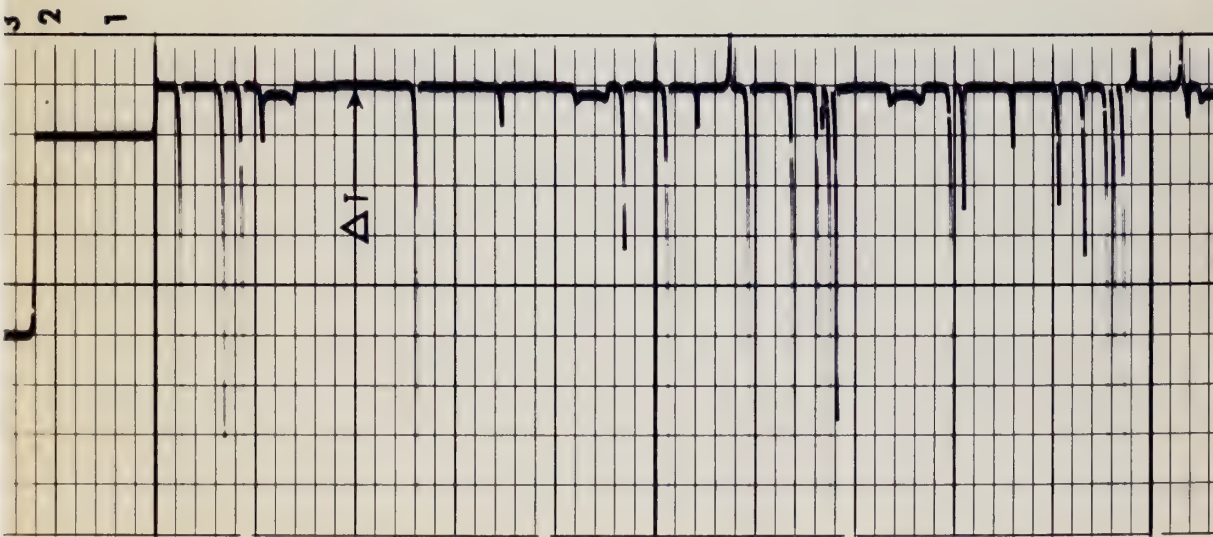
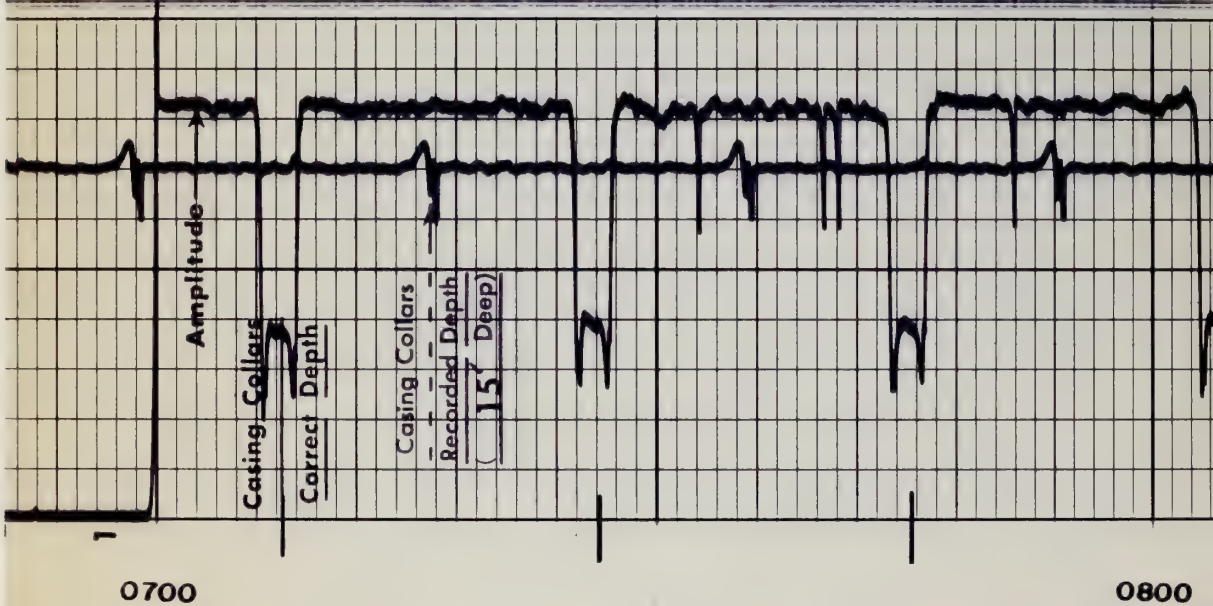
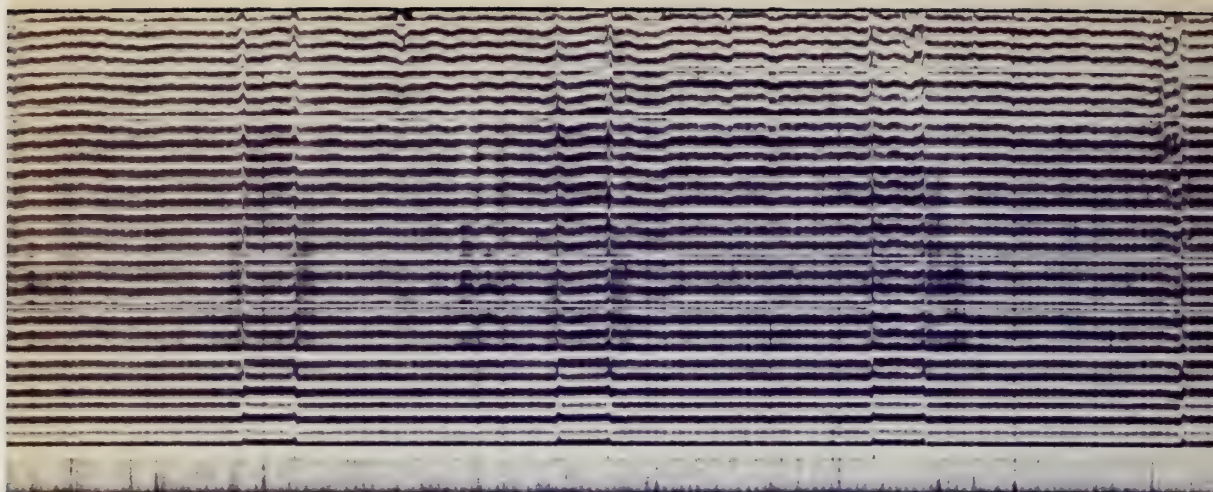


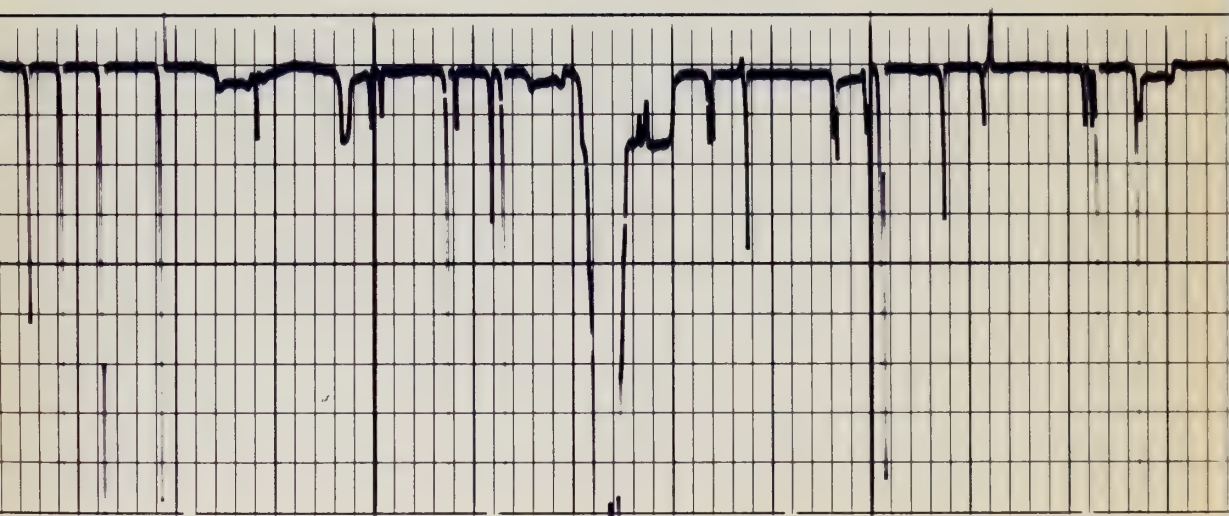
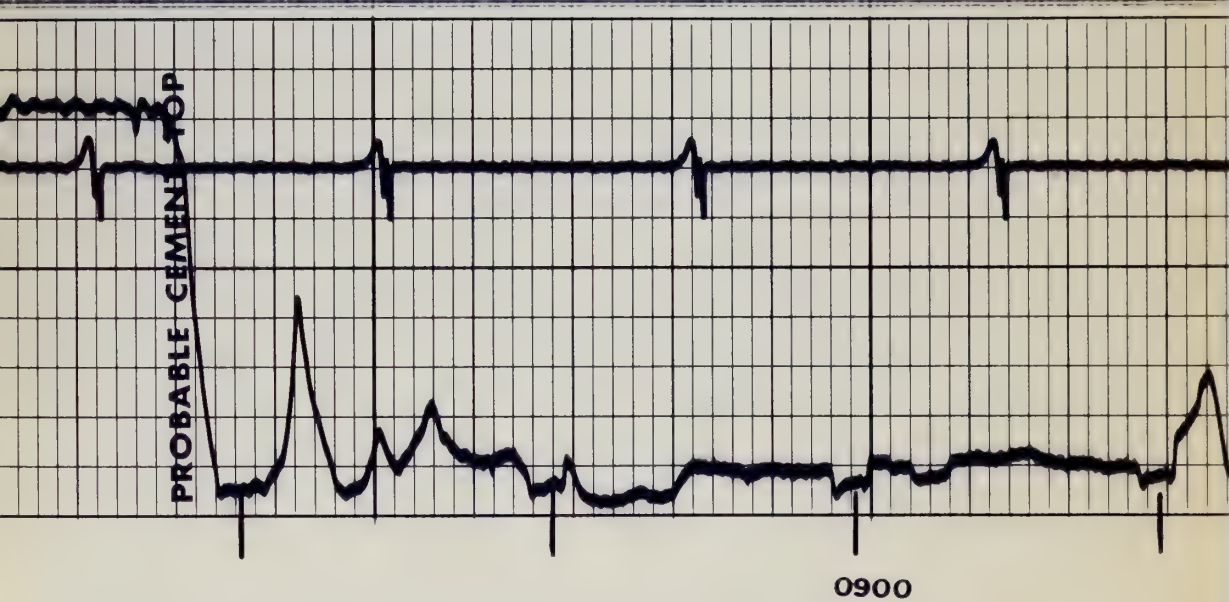
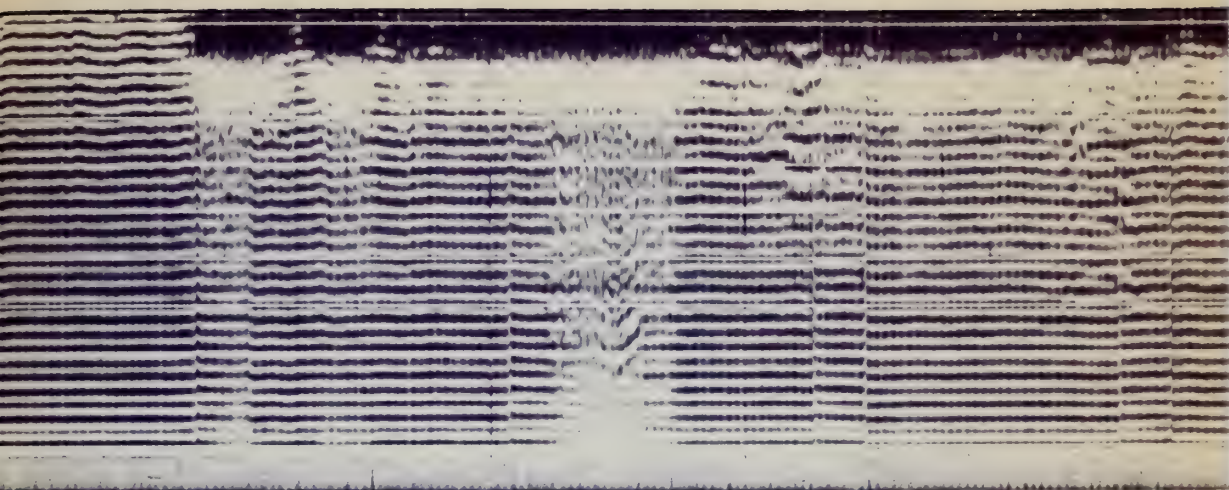


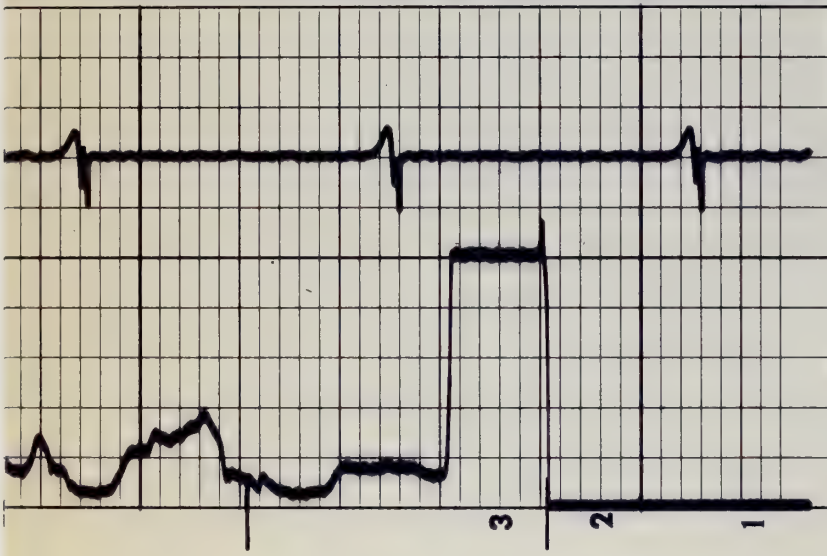
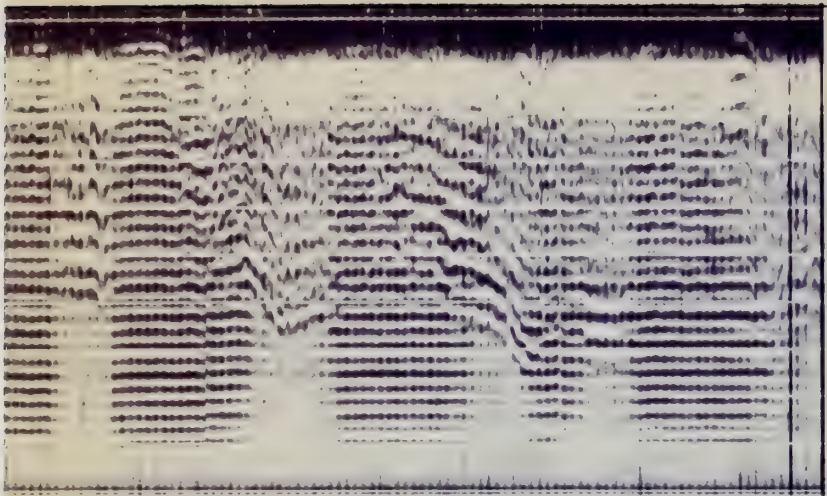


REPEAT SECTION

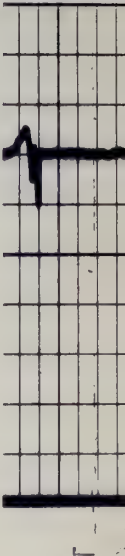
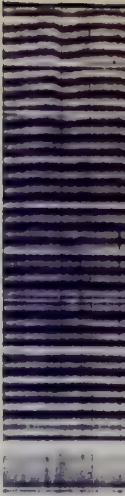
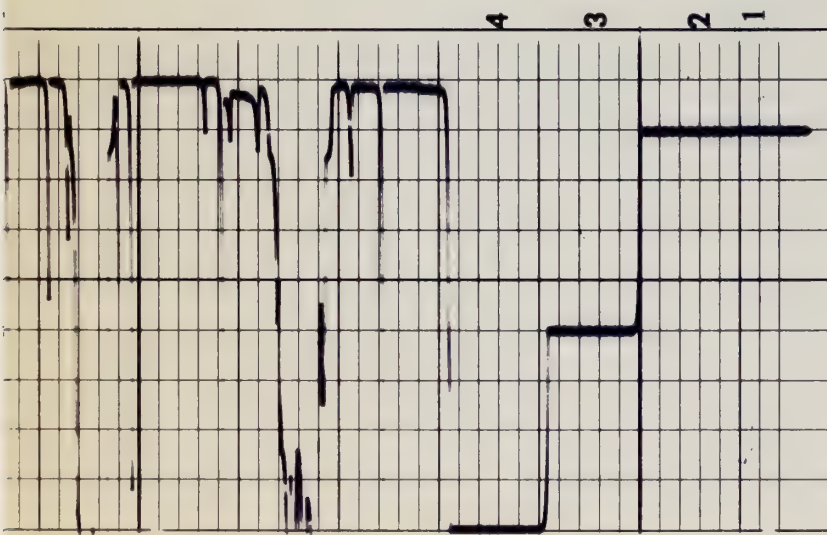
NO. 1
LONG
STEP

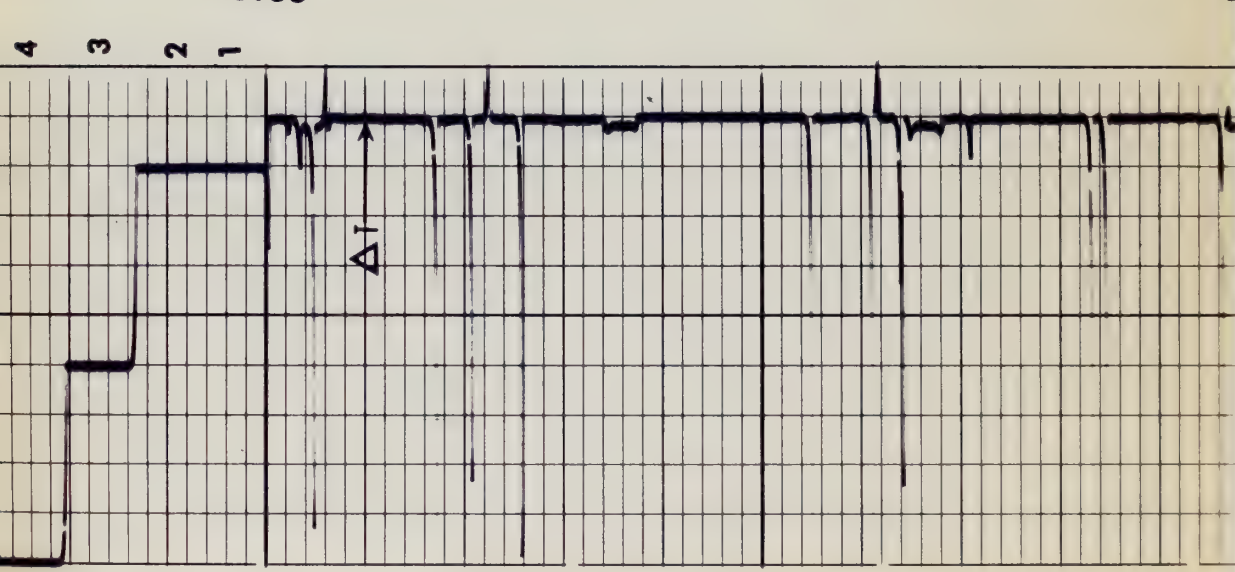
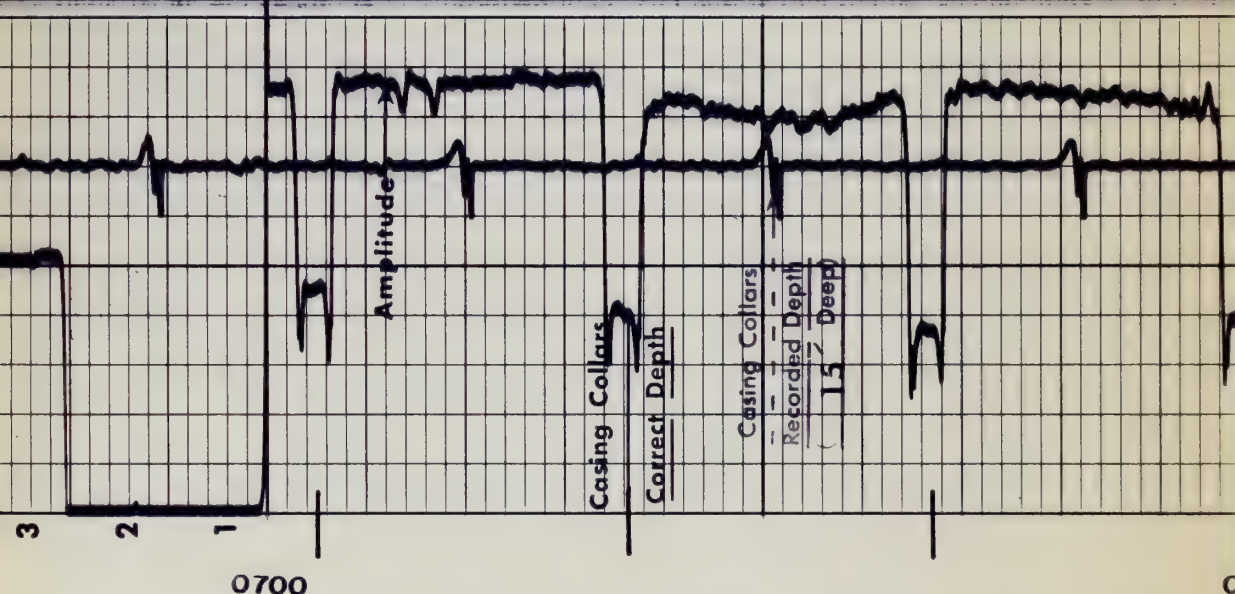
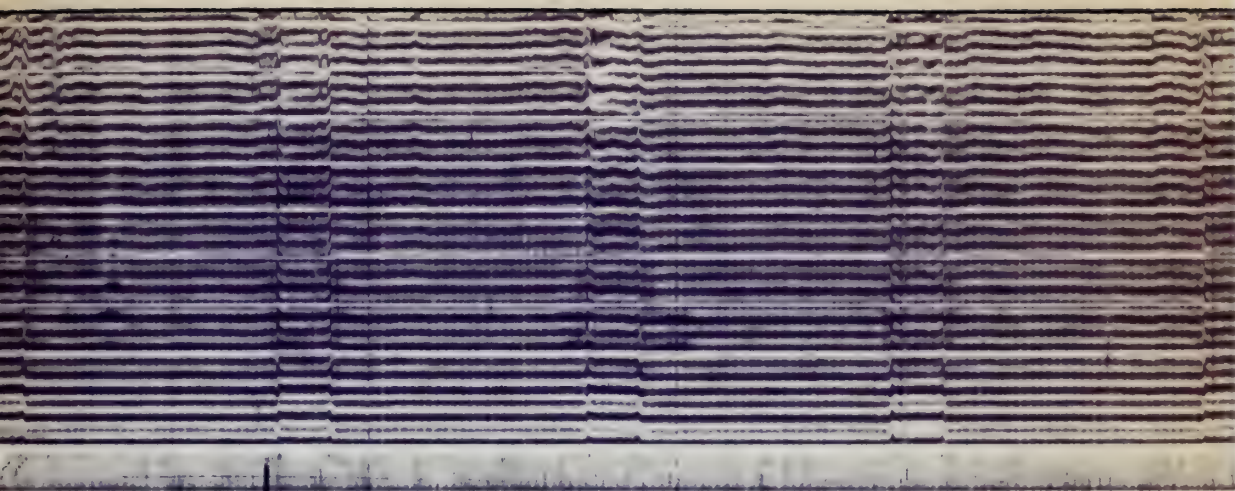


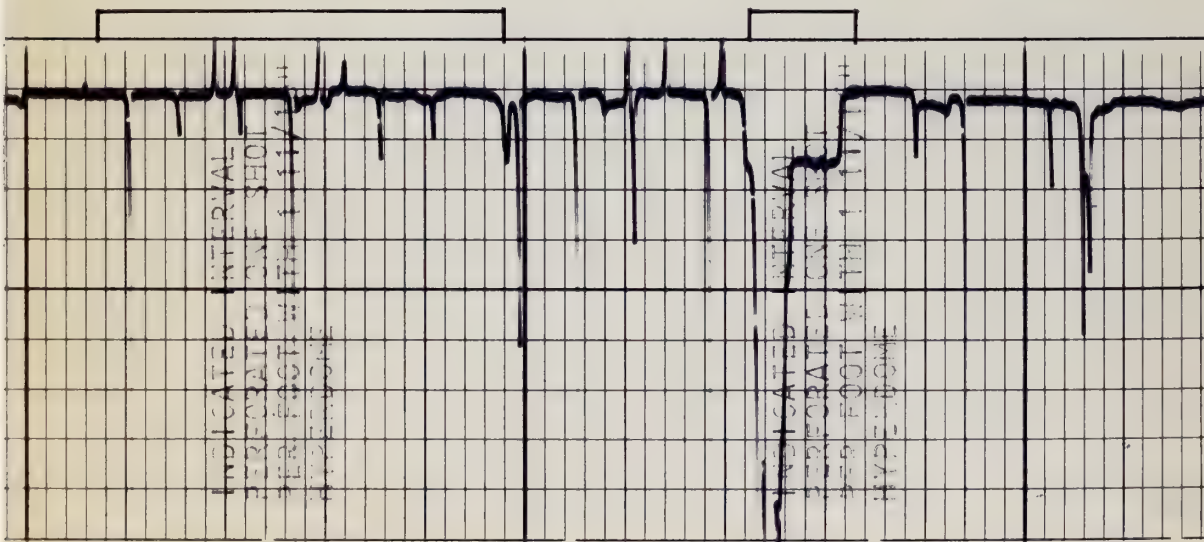
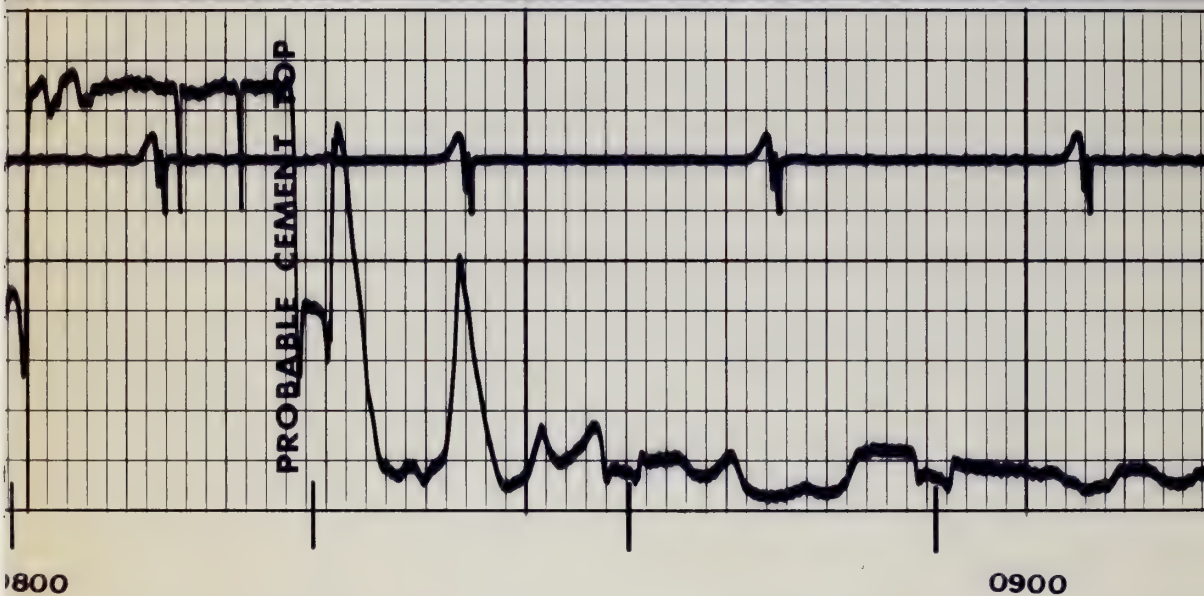
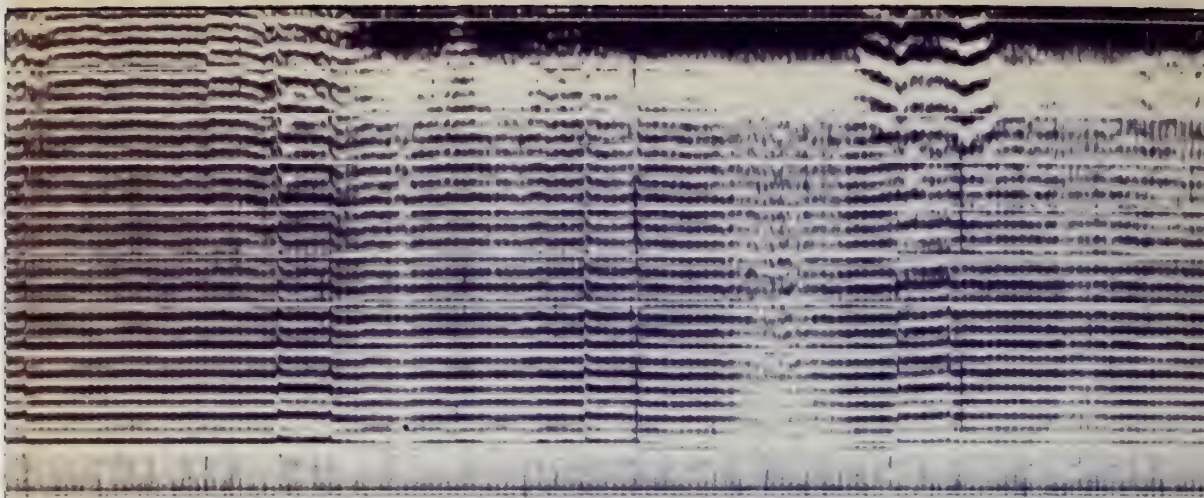


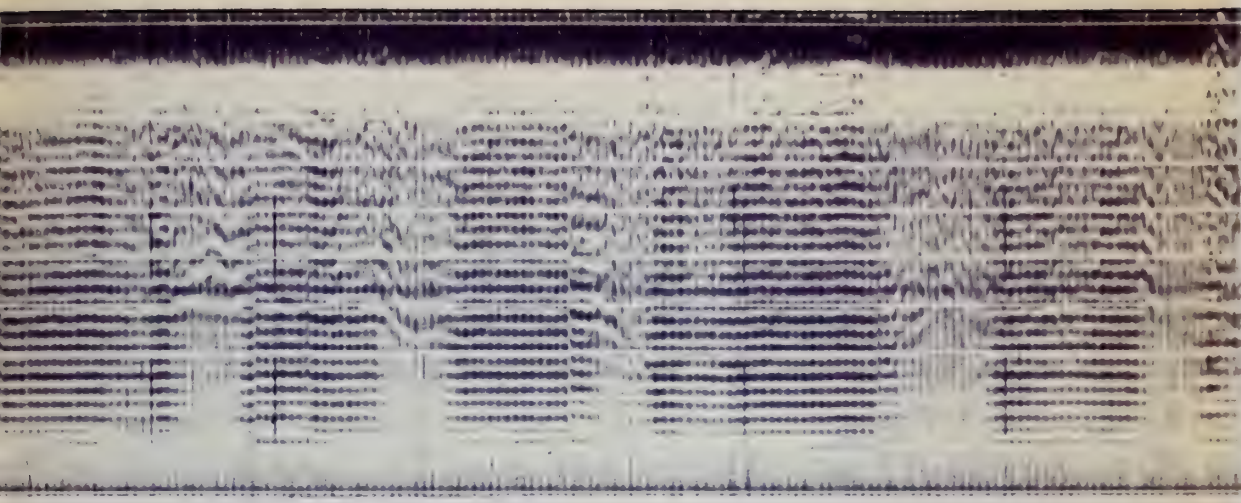


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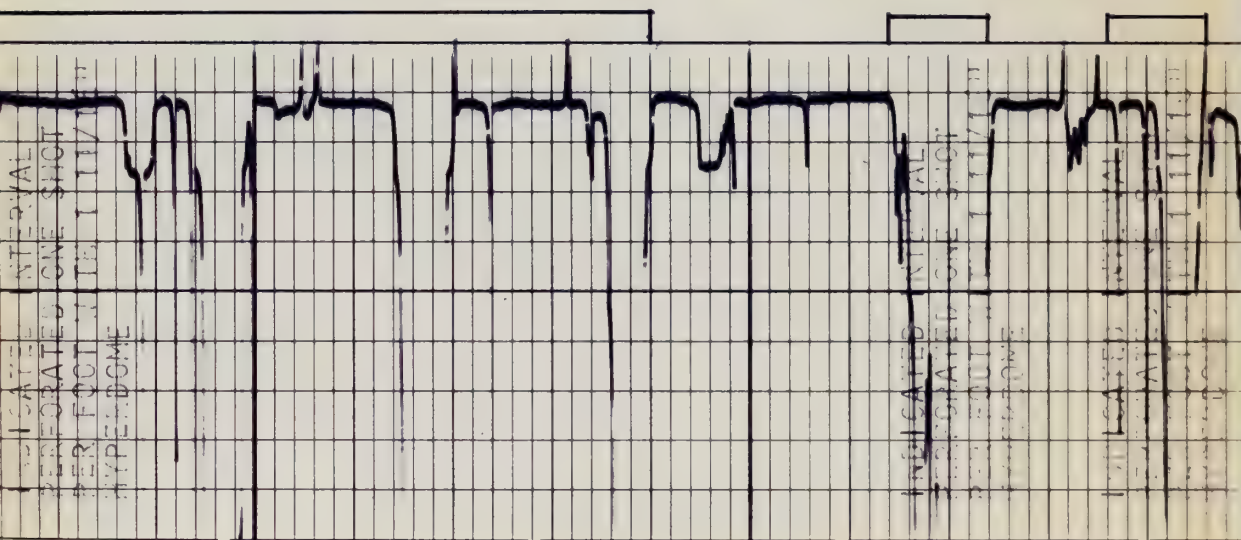


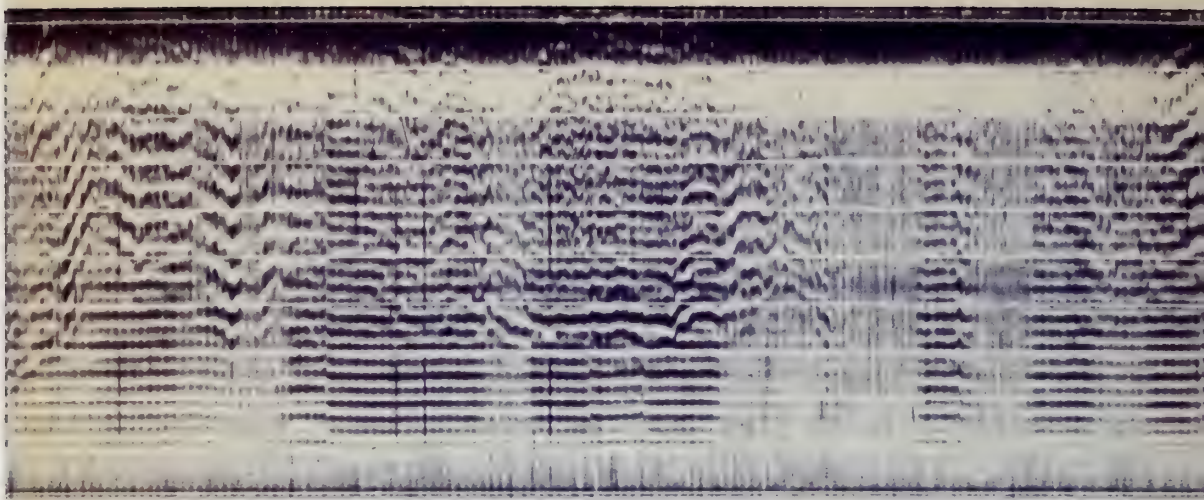




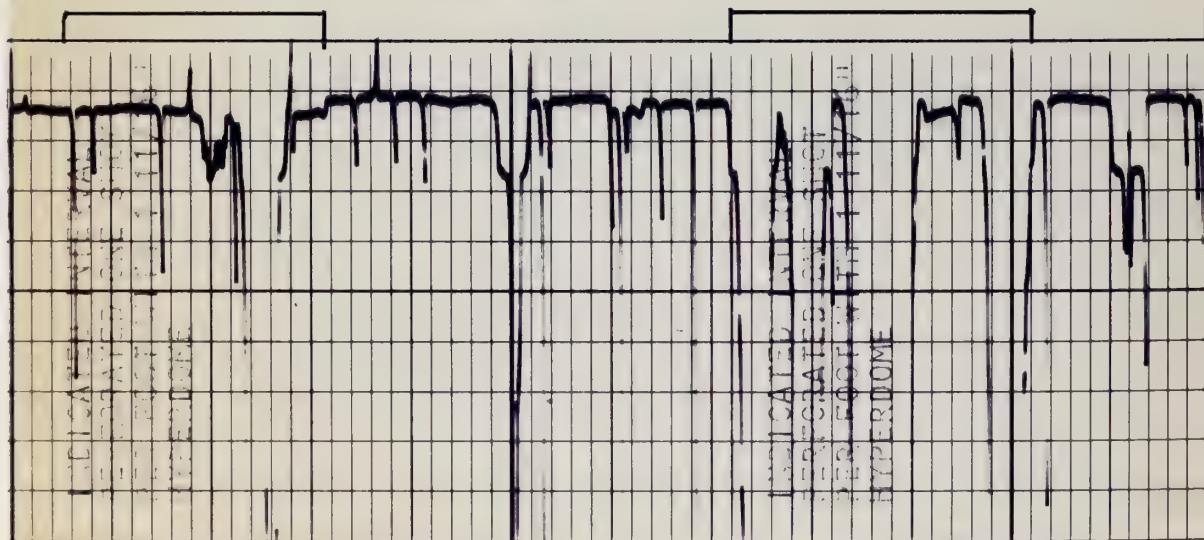


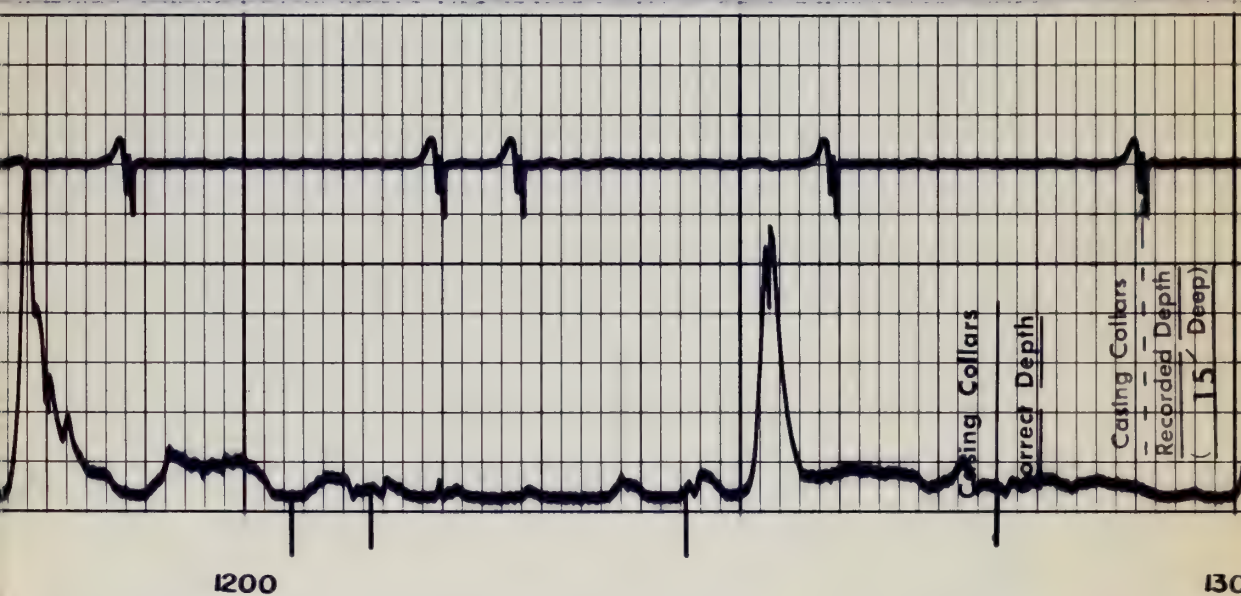
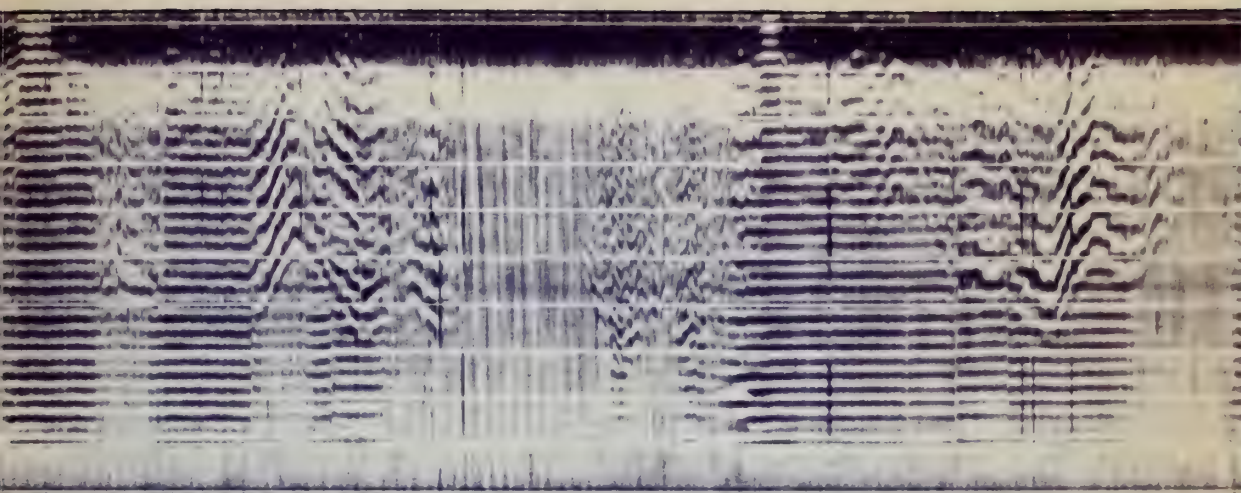
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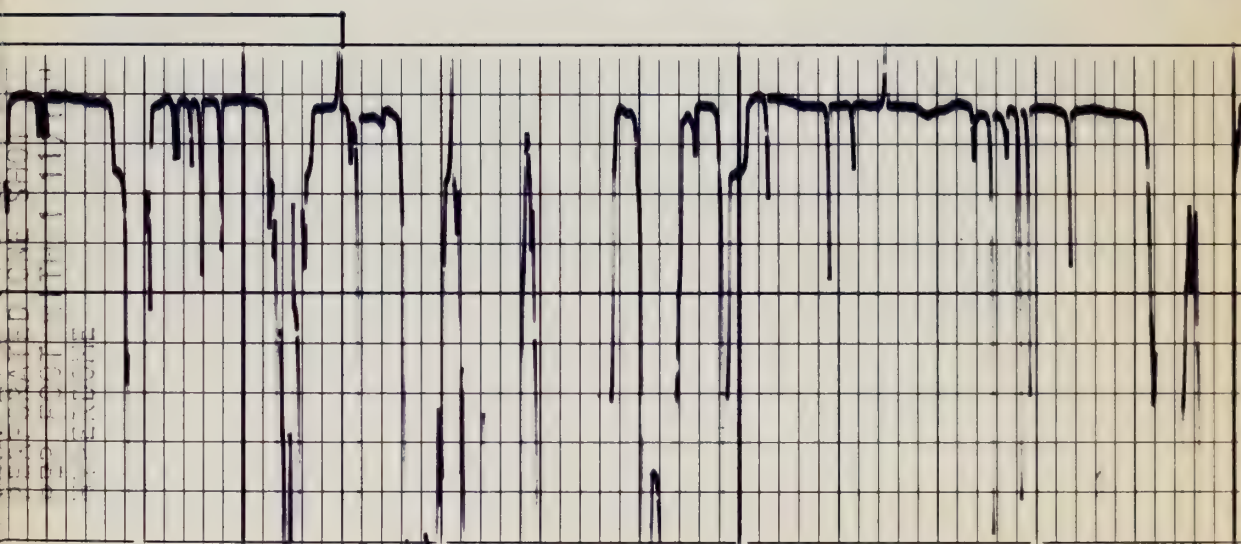
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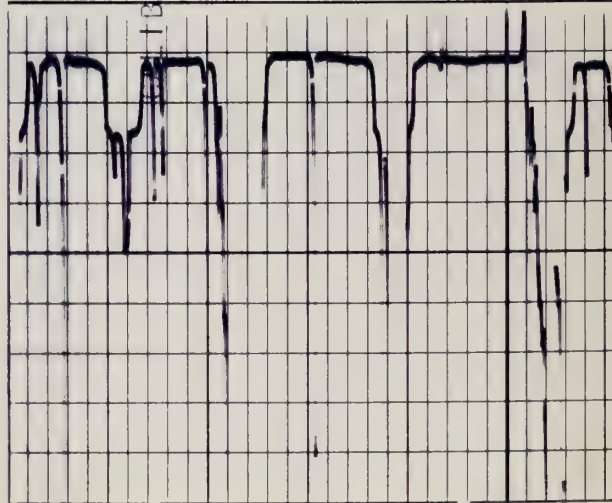
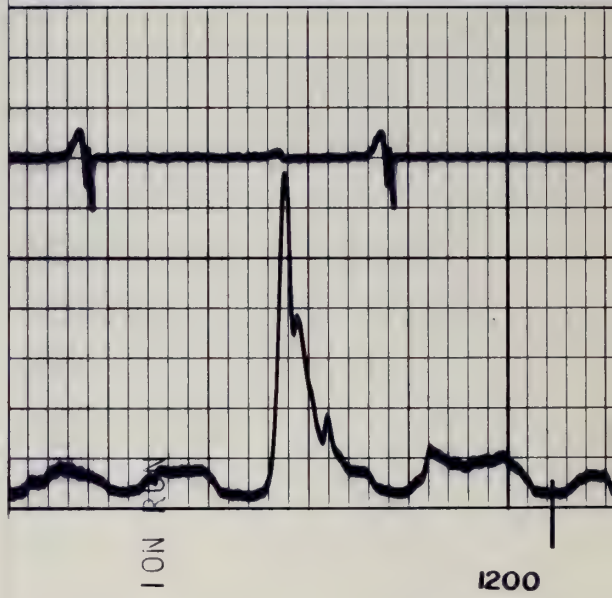
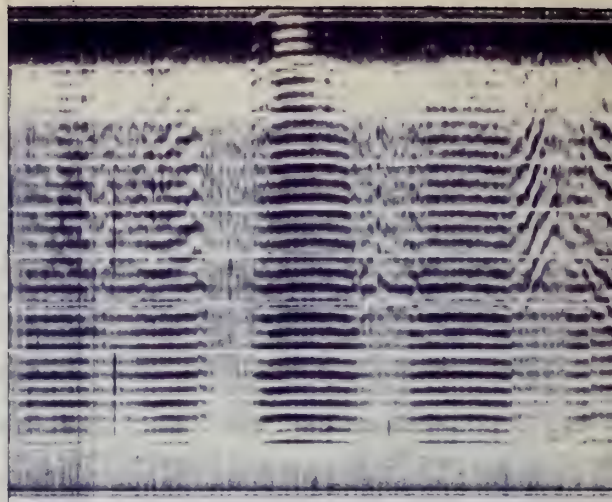
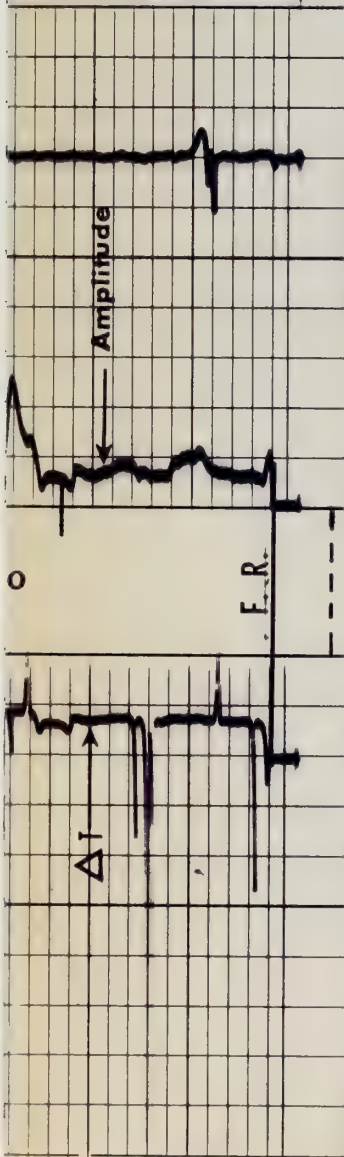
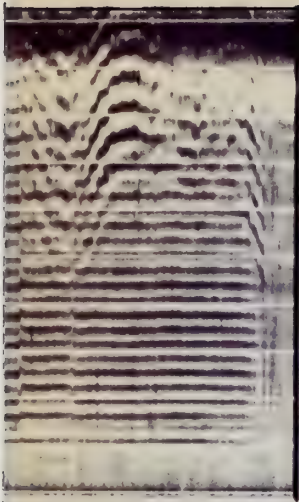


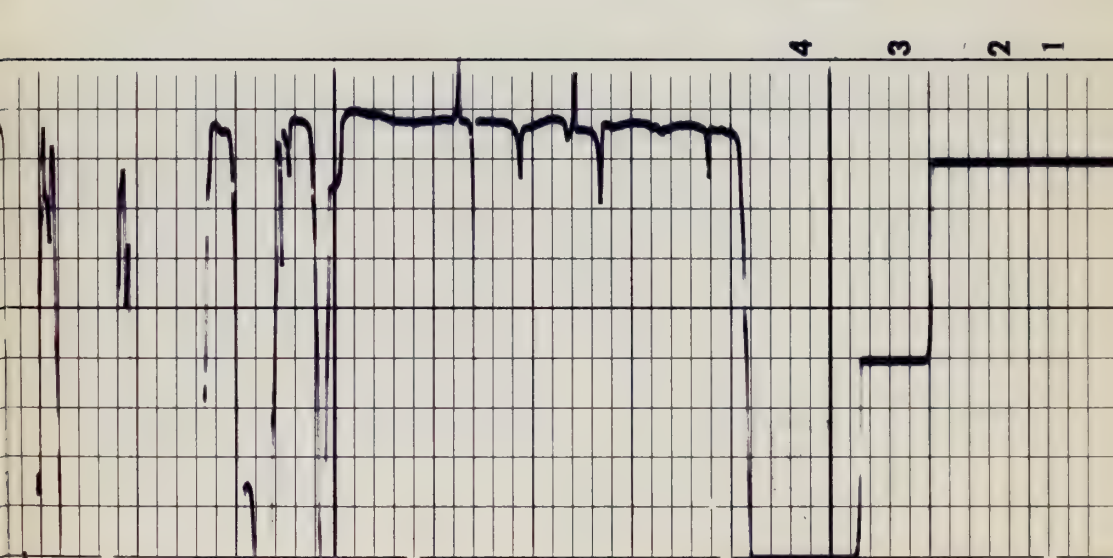
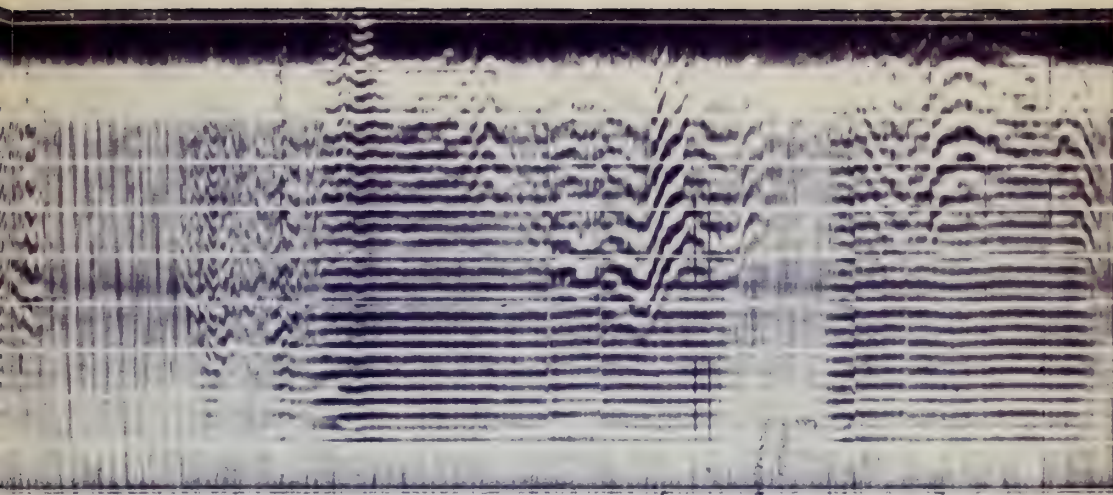


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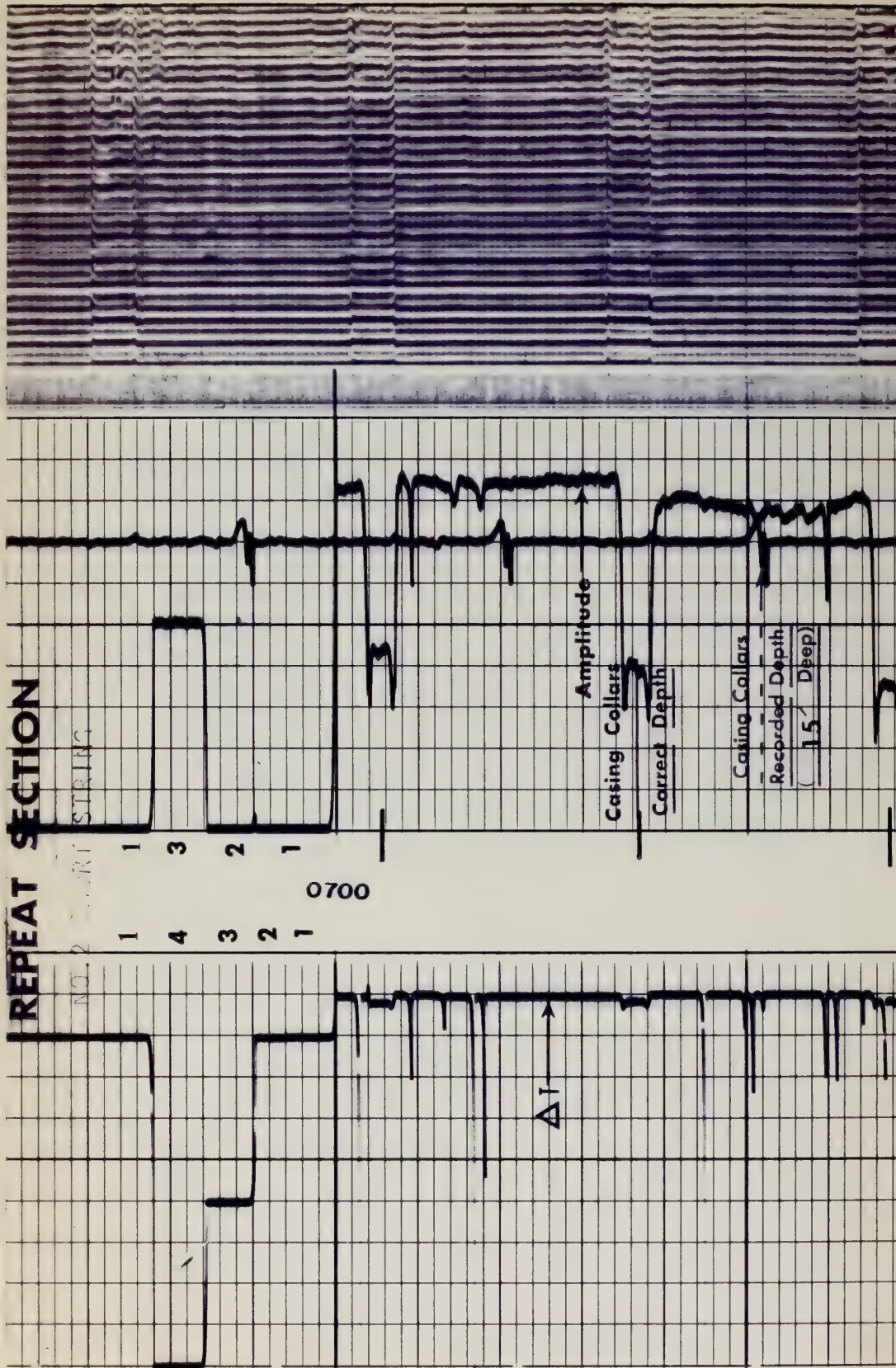
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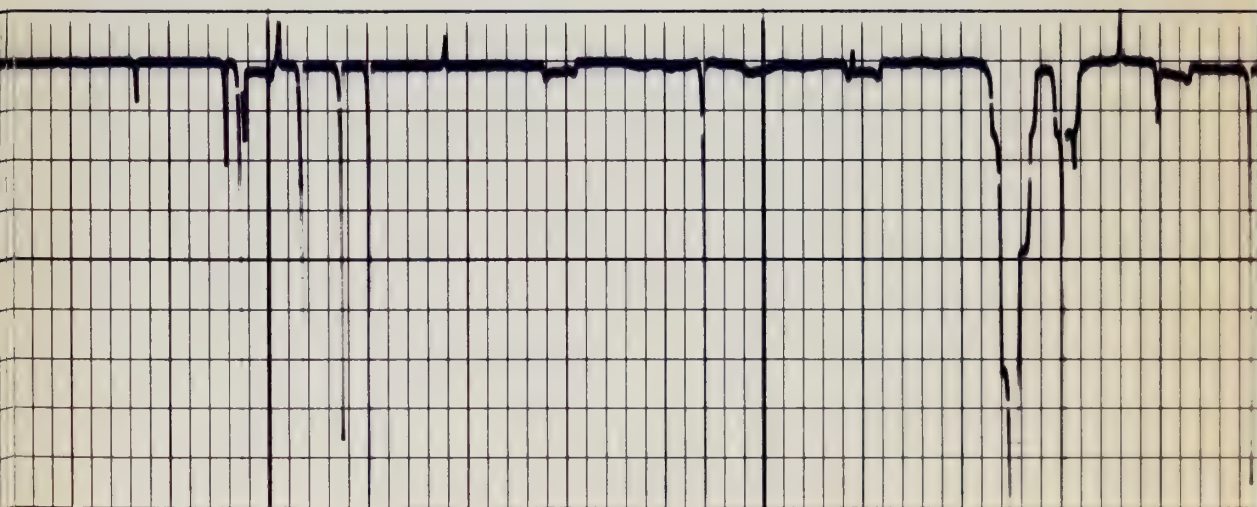
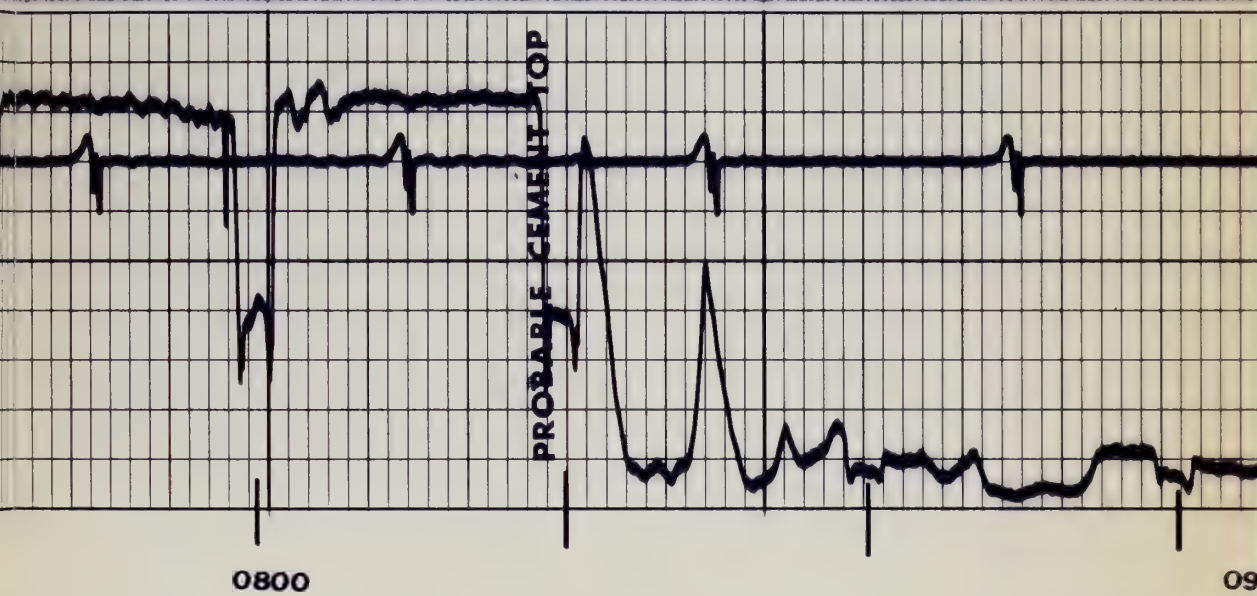
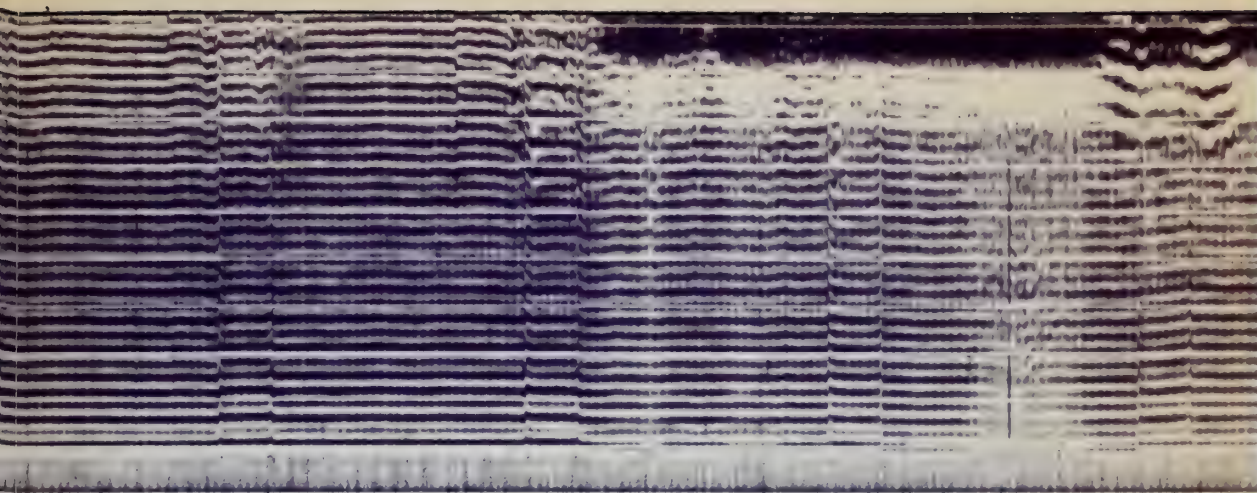


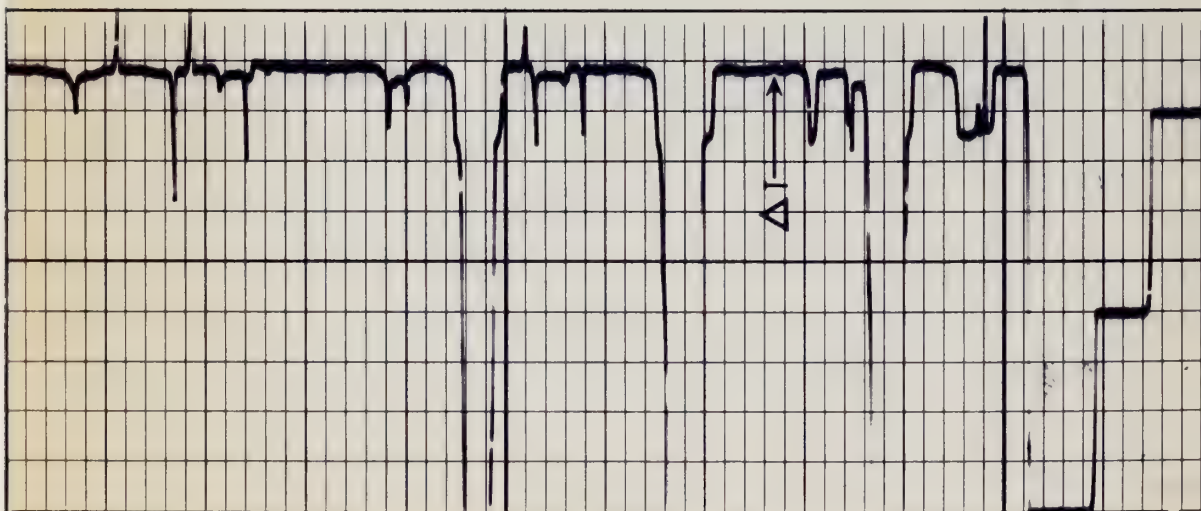
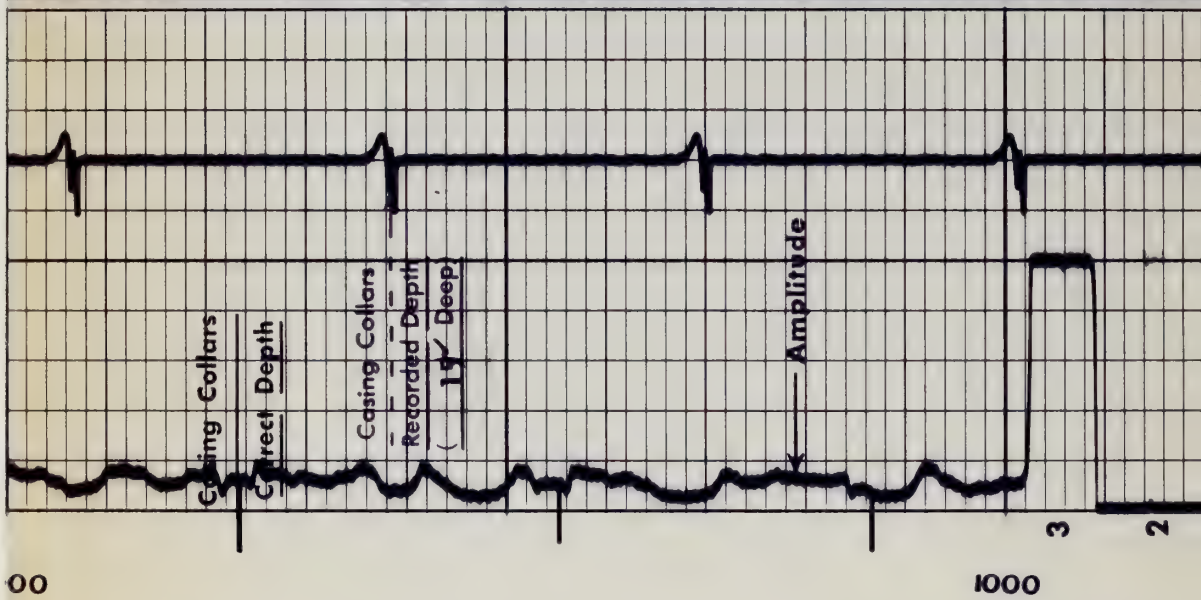
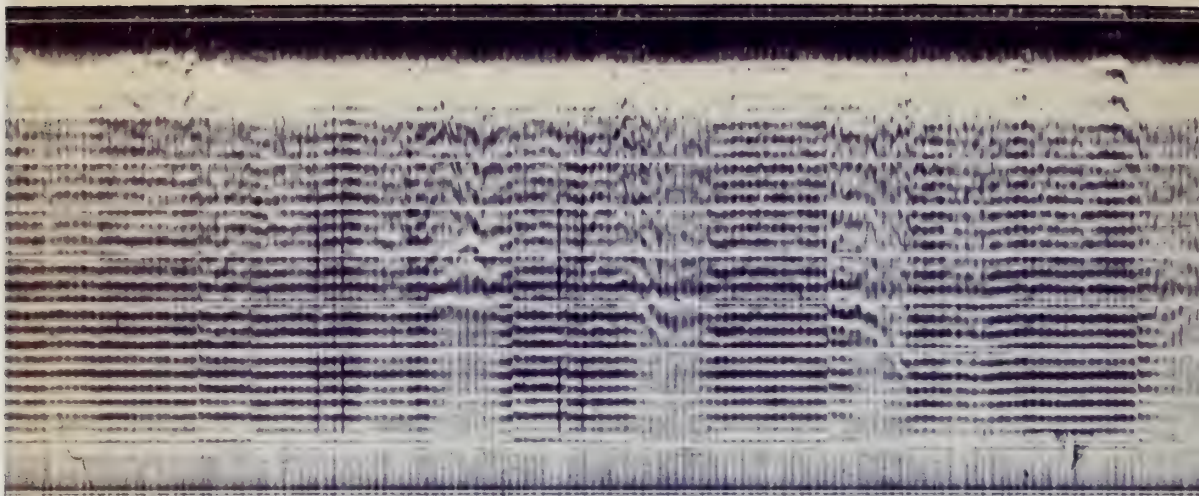




REPEAT SECTION







TRANSIT TIME MICROSECONDS _____ SPACING _____ 400 ----- 200		Casing Collars _____ Corrected Depth _____		CASING BOND MILLIVOLTS _____ 0 ----- 100		VARIABLE DENSITY MICROSECONDS _____ SPACING _____ 200 ----- 1200	
DEPTH							
COMPANY <u>ATLANTIC RICHEFIELD COMPANY</u> WELL <u>S.G. NO. 9</u> FIELD <u>SORGHUM GULCH</u> COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u>							
SCHL. FR <u>2712</u> SCHL. TD <u>2720</u> DRLR TD <u>----</u> Elev: KB <u>----</u> DF <u>----</u> GL <u>6870</u>							

CEMENT BOND CALIBRATION CODING

	Δt	AMPLITUDE
1. MECHANICAL ZERO		MECHANICAL ZERO
2. 240 μ sec		ELECTRICAL ZERO
3. 320 μ sec		CALIBRATE
4. 400 μ sec		

Schlumberger

CEMENT BOND LOG

GR-CCL-VDL

COUNTY Field or LOCATION WELL COMPANY	COUNTY	FIELD	LOCATION	WELL	COMPANY
	Field or	SORGHUM GULCH	S.G. NO. 11	ATLANTIC RICHFIELD COMPANY	
	LOCATION	SORGHUM GULCH			
	WELL				
COMPANY _____ ATLANTIC RICHFIELD COMPANY _____ WELL _____ S.G. NO. 11 _____ FIELD _____ SORGHUM GULCH _____ COUNTY _____ RIO BLANCO _____ STATE _____ COLORADO _____ LOCATION _____ API Serial No. _____ 12' NSL & 160' WEL _____ Sec. _____ 7 _____ Twp. _____ 3S _____ Rge. _____ 96W _____					
Other Services:					

Permanent Datum: _____ GROUND LEVEL _____, Elev. 6900 _____
 Log Measured From _____ GL _____, _____ 0 _____ Ft. Above Perm. Datum _____
 Drilling Measured From _____ GL _____
 Elev.: K.B. _____
 D.F. _____
 G.L. 6900 _____

Date	9-24-74	Type Drill Fluid	WATER
Run No.	ONE	Fluid Level	FULL
Depth — Driller	2814	Max. Rec. Temp.	----- °F
Depth — Logger	2812	Est. Cement Top	1110
Btm. Log Interval	2804	Equip. Location	3862 VERNAL
Top Log Interval	950	Recorded By	ST. AUBYN
Open Hole Size	7 7/8	Witnessed By	MR. ELLARD

CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String	8 5/8					
Prot. String (1)	2 3/8	4.7		T & C	0	2820
Prod. String (2)	2 3/8	4.7		T & C	0	1511
Liner String (3)	2 3/8	4.7		T & C	0	1323

PRIMARY CEMENTING DATA

STRING	Surface	Protection	Production	Liner
Vol. of cement			235 SKS	
Type of cement			HOWCO LT. WT.	
Additive			10#/SK GILSONITE	
			.3% LWL	
Retarder				
Wt. of slurry				
Water loss				
Type fluid in csg.				
Fluid wt.				

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

PRIMARY CEMENTING PROCEDURE		REMARKS
	Hour — date	Hours from start of operation
Started pumping cement		
Release pressure	13:00 9-14-74	
Start Cement Bond Log	16:00 9-24-74	
Finish Cement Bond Log	22:00 9-24-74	
Preceding fluid	Volume _____ bbls.	Pipe reciprocated during Pumping: Yes _____ No _____
Cement pumped	_____ bbls./minute	Pipe reciprocated after plug down: Yes _____ min., No _____

SQUEEZE JOB DETAIL			EQUIPMENT DATA	Centralizer Depths	Scratcher Depths
Squeeze number	1	2	Sonic Panel No.	SLP-FH#639	
Date			Sonic Cart No.	SHH-AHA#45	
Depth interval			Sonic Sonde No.	SLT-CC#54	
Type cement			CRP No.	14	
Volume of cement			Mem Panel No.	MMP-B#201	
Additive			GR Panel No.	GNP-D#556	
Retarder			GR Cart No.	SHH-AFA#91	
Weight of slurry			Centralizer: Type	CME-V CAL-AJ	
Preceding fluid			No.	CMEW	
Breakdown pressure			To Level (MV)	100	
Max. pressure-stage 1			Cart. Gain	1/20	
" " " 2			CRP Intensity	.16	
" " " 3			R9G Intensity	7 1/2	
Final maximum pressure			Logging Speed	30 FPM	
Started pumping cement			Time Constant		
Released pressure					
Start CBL					
Finish CBL					
AVERAGE WELL DRIFT:					
° from	to	° from	to	° from	to

TRANSIT TIME

MICROSECONDS _____ SPACING
400 _____ 200

GAMMA RAY API UNITS

DEPTH

GRADING BAND

MILLIVOLTS
0 _____ 100

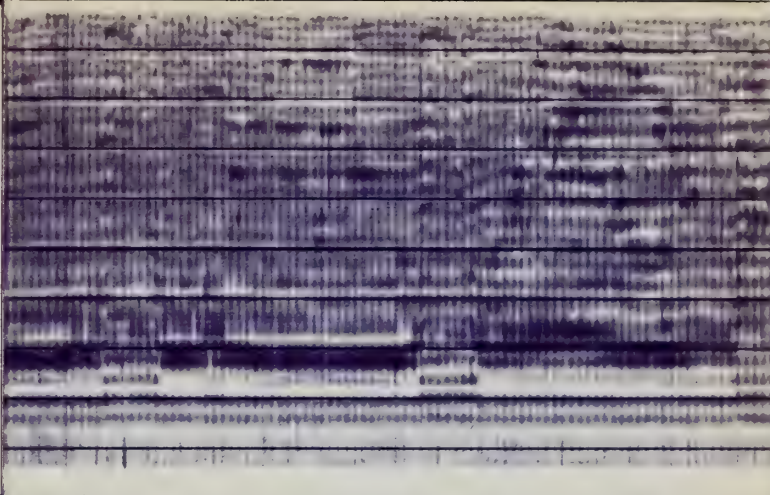
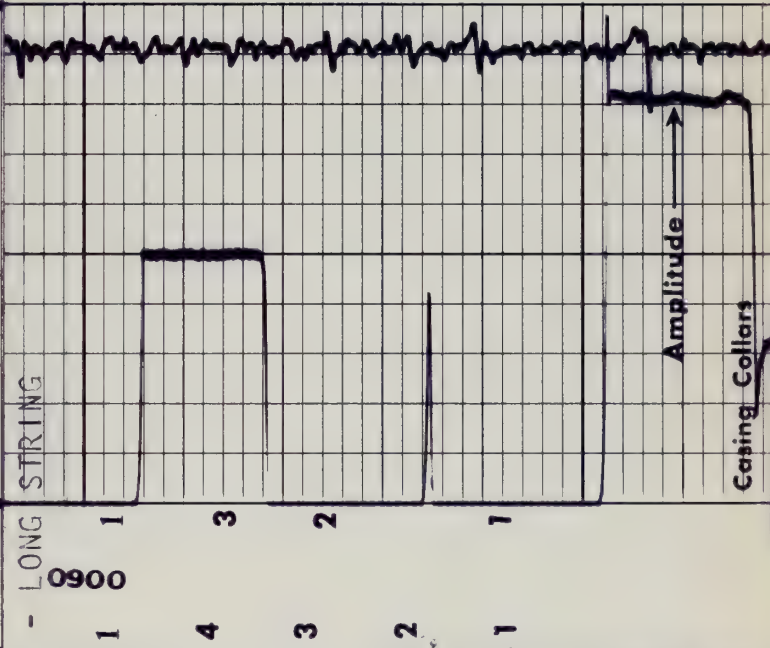
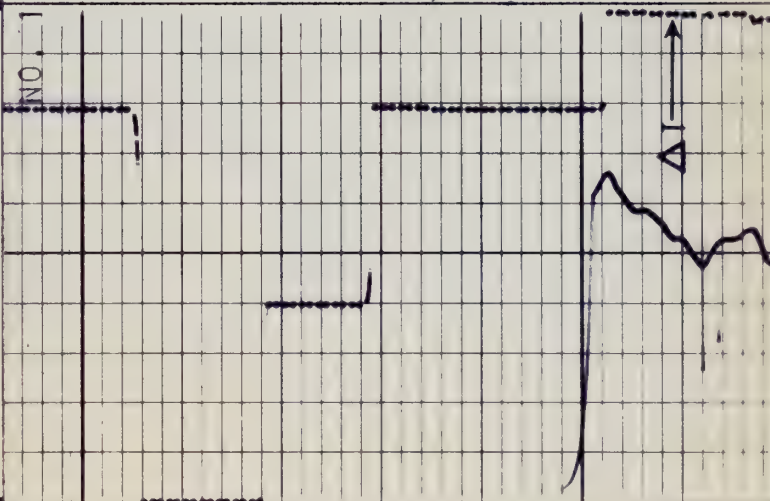
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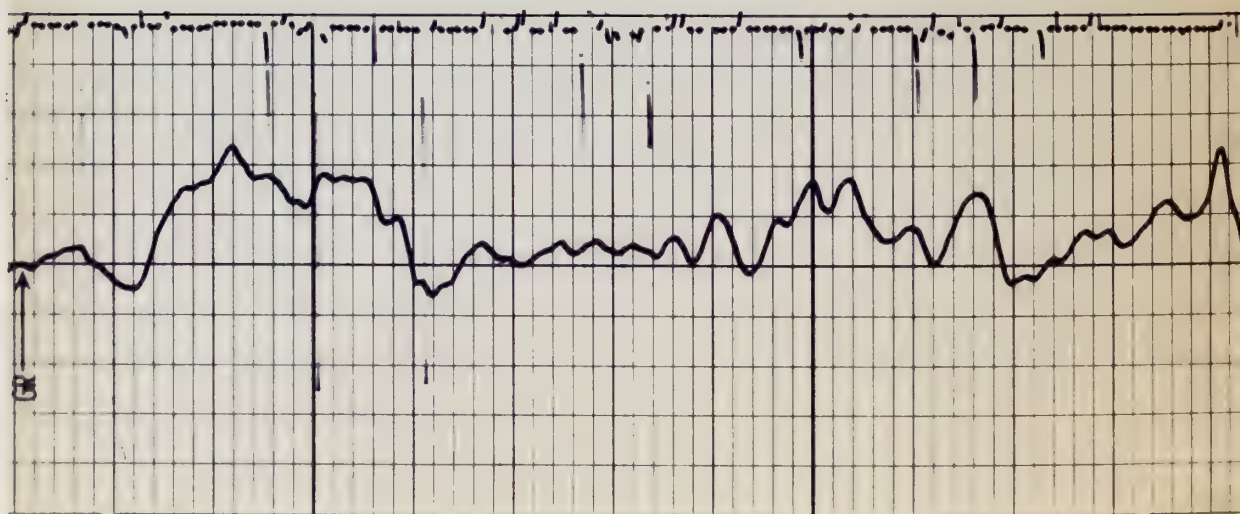
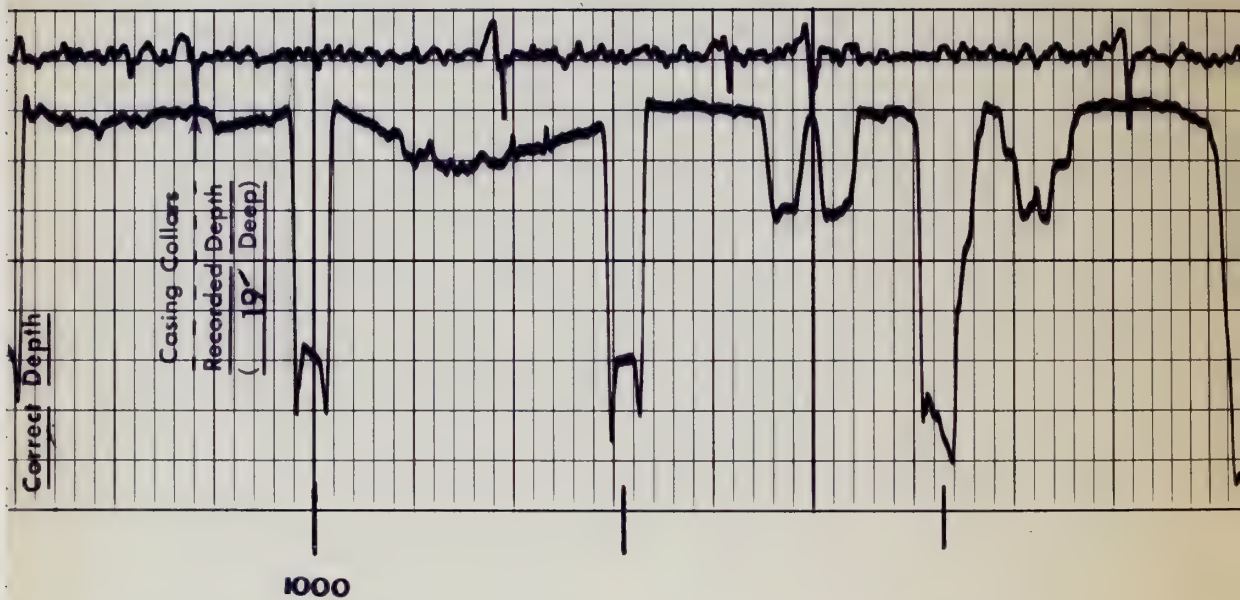
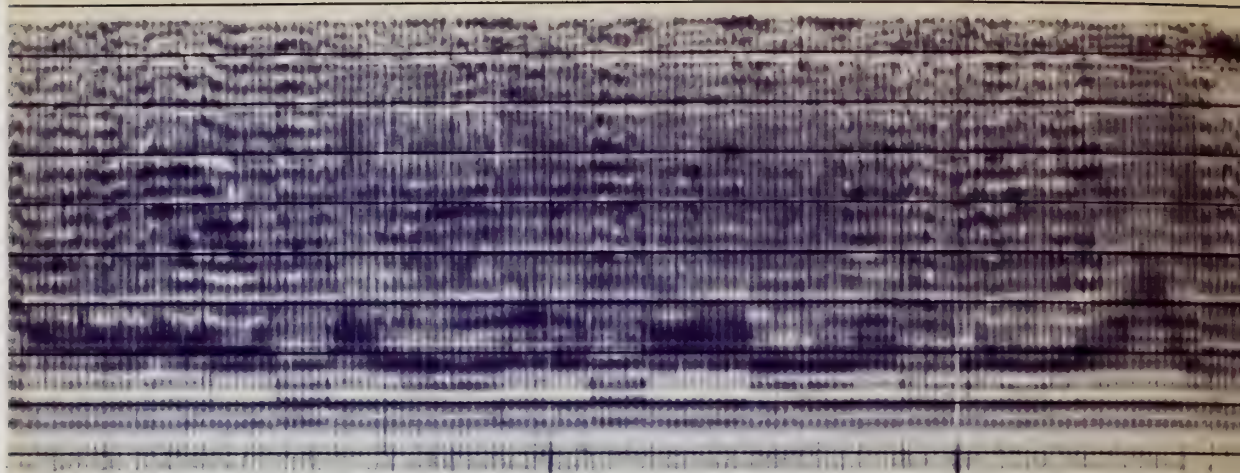
MICROSECONDS _____ 5 FT. SPACING
200 _____ 1200

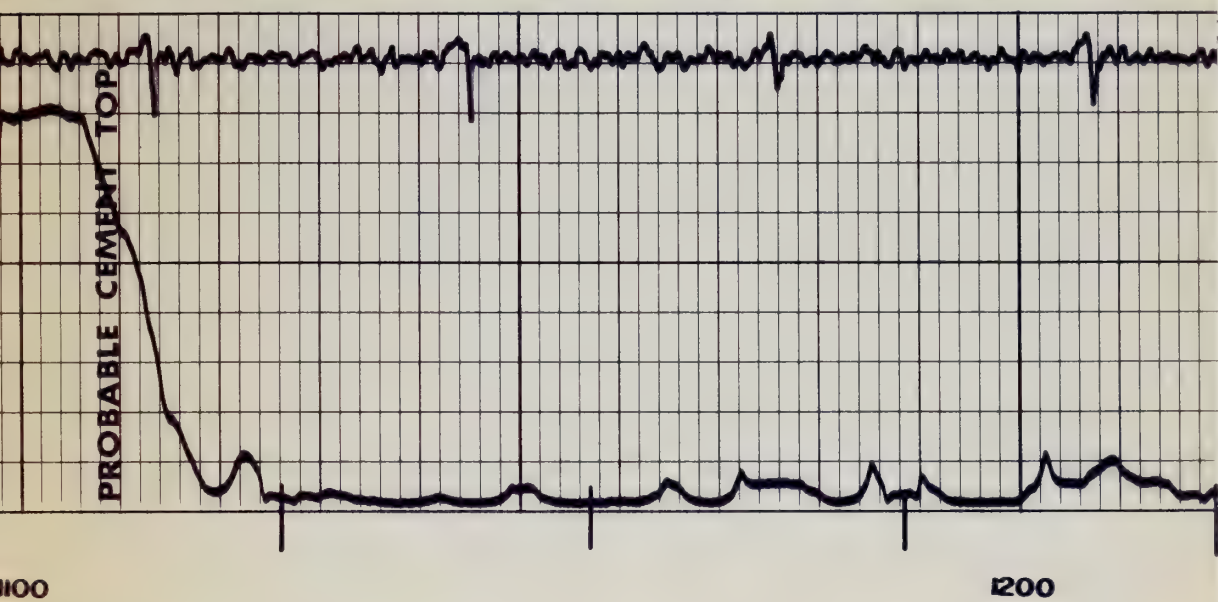
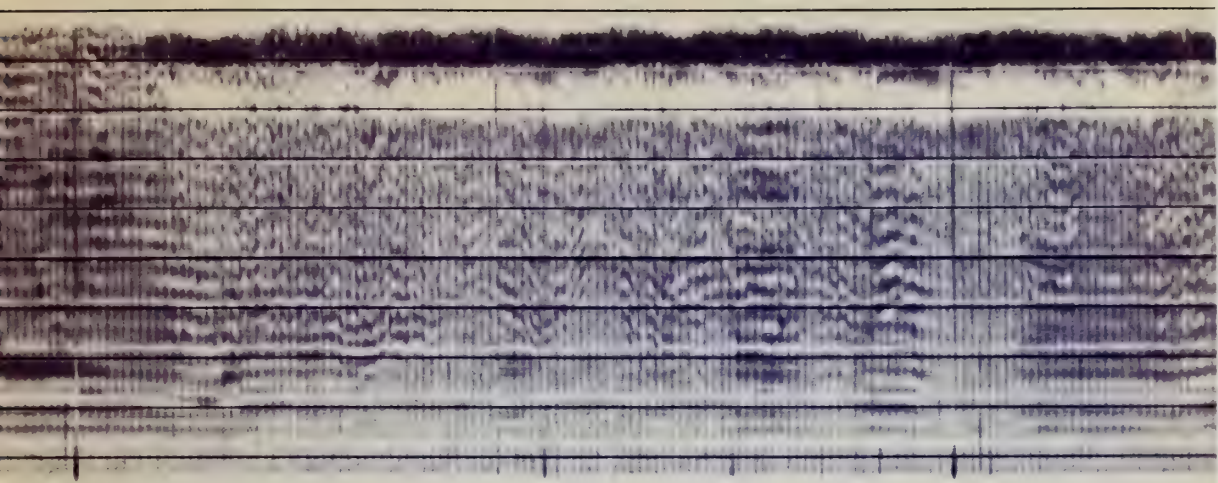
Casing Collars
Corrected Depth

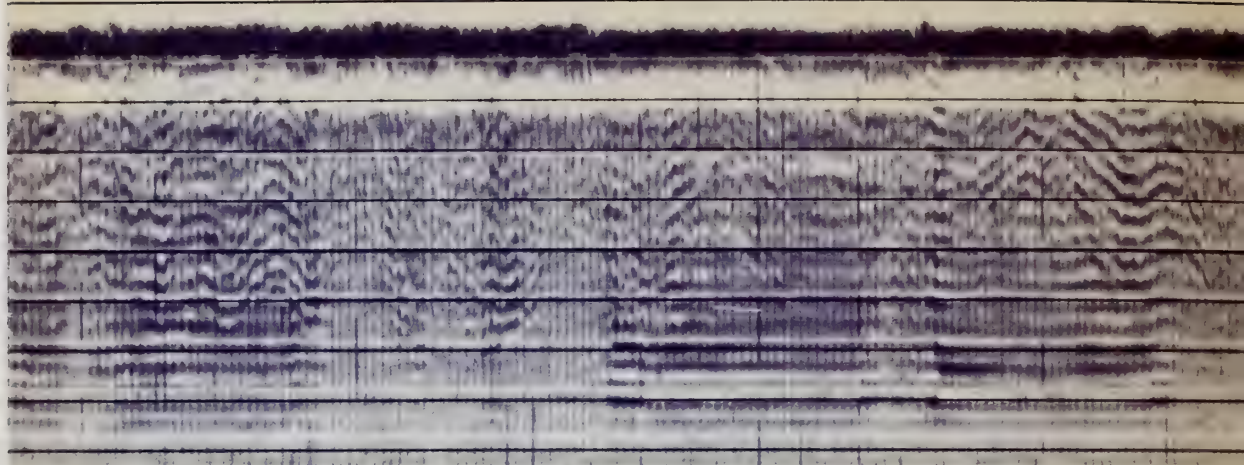
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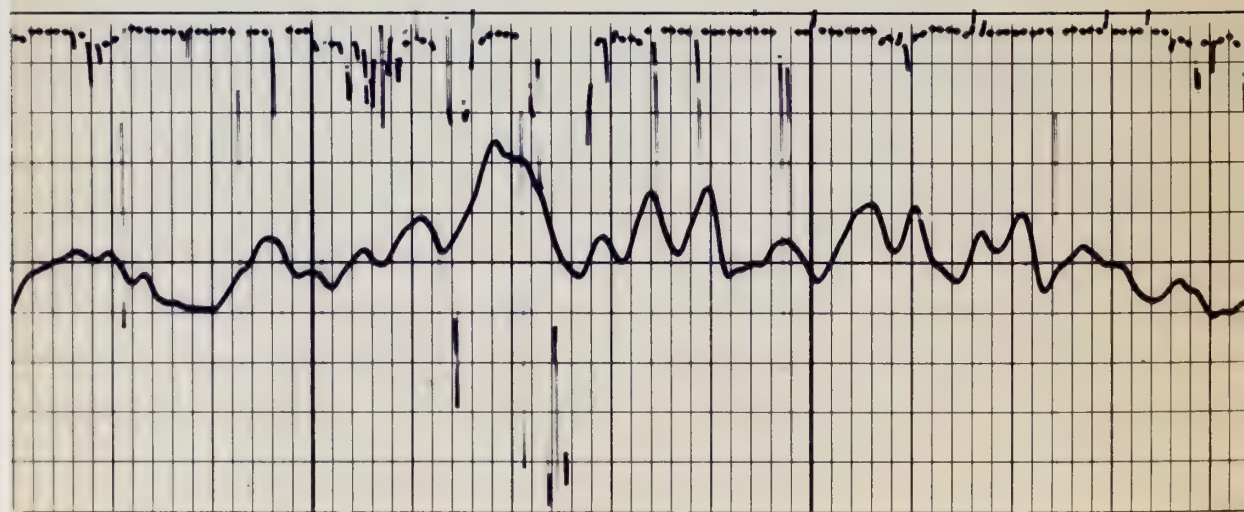


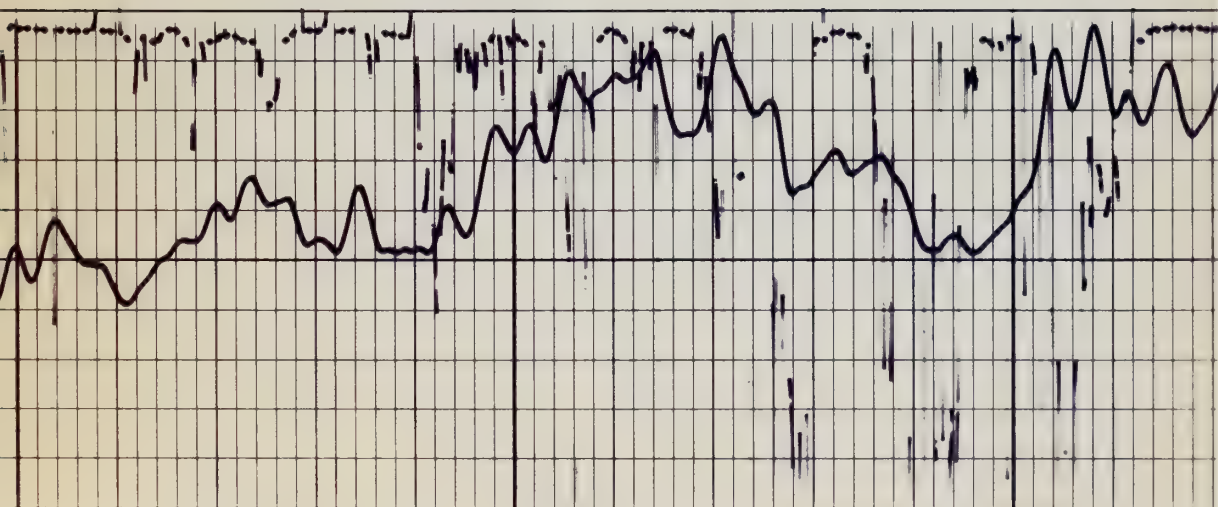
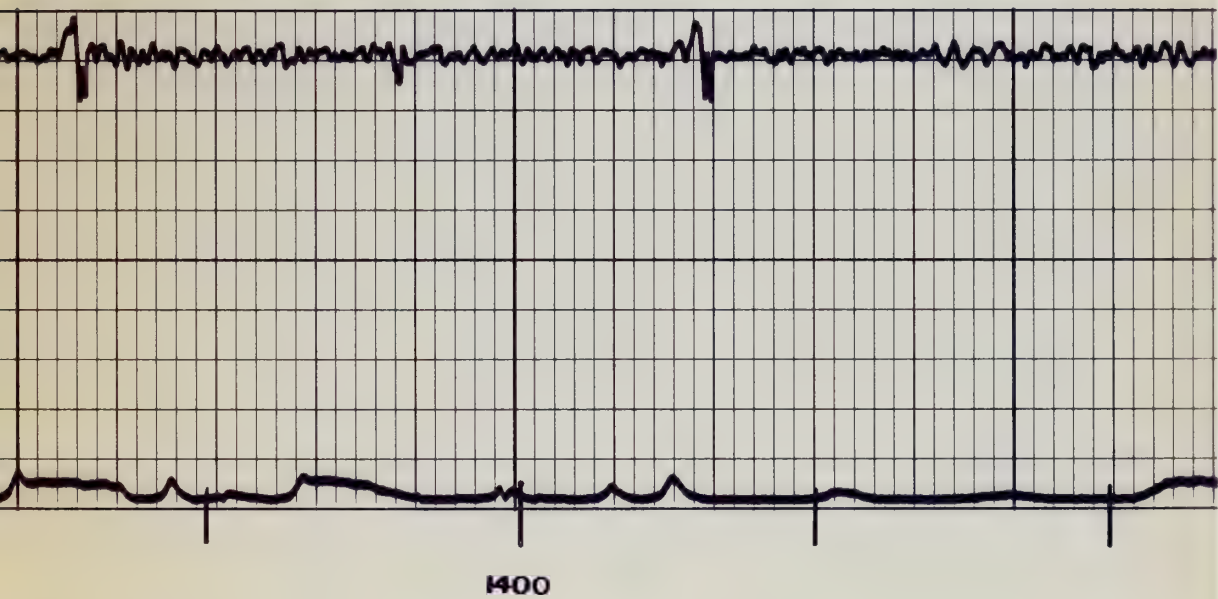
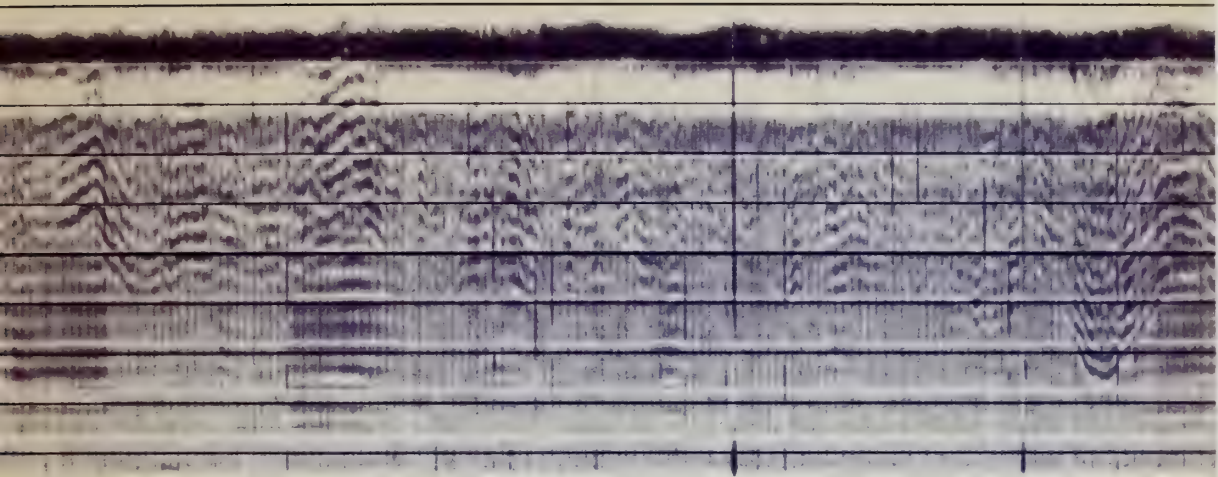


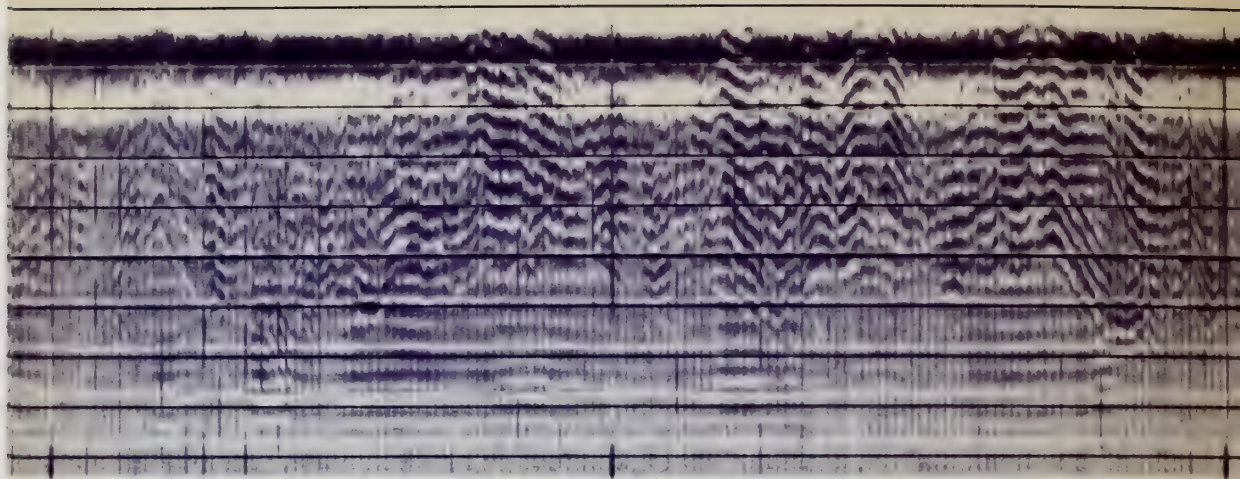




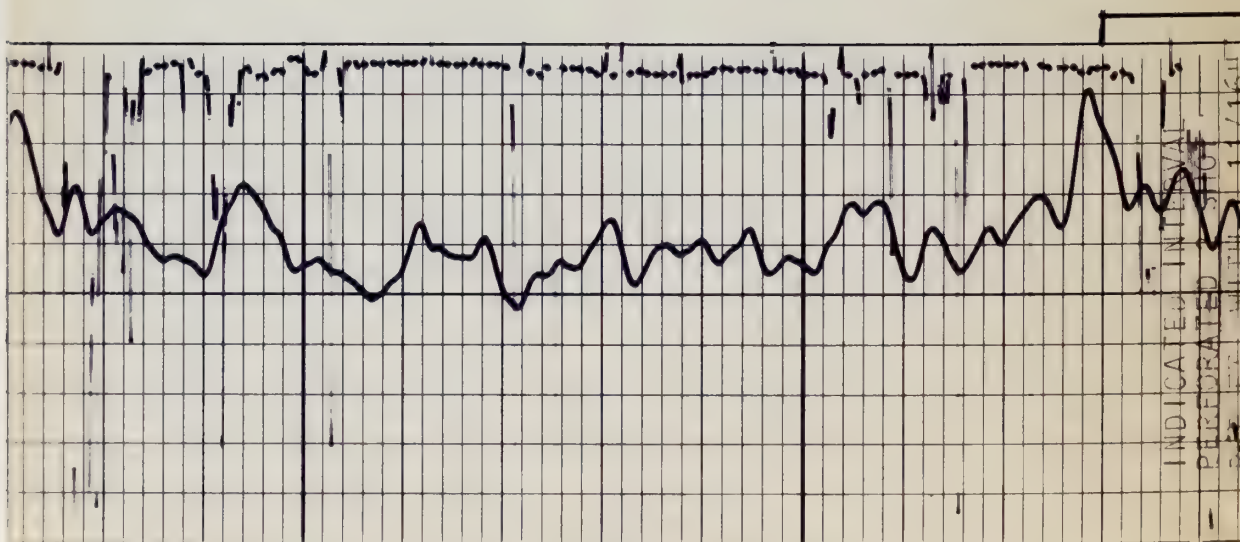
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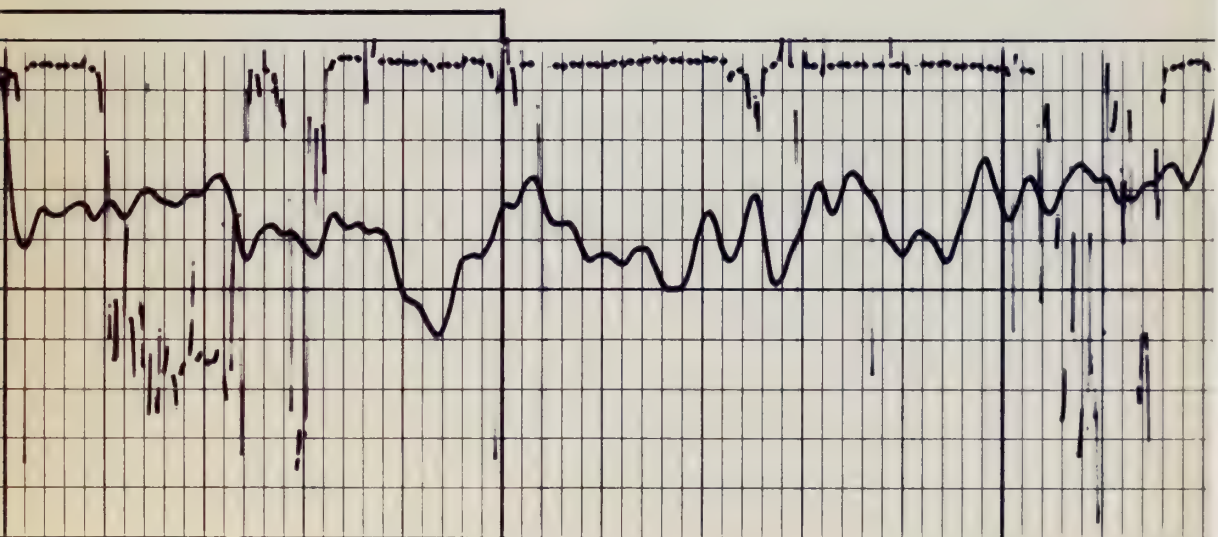
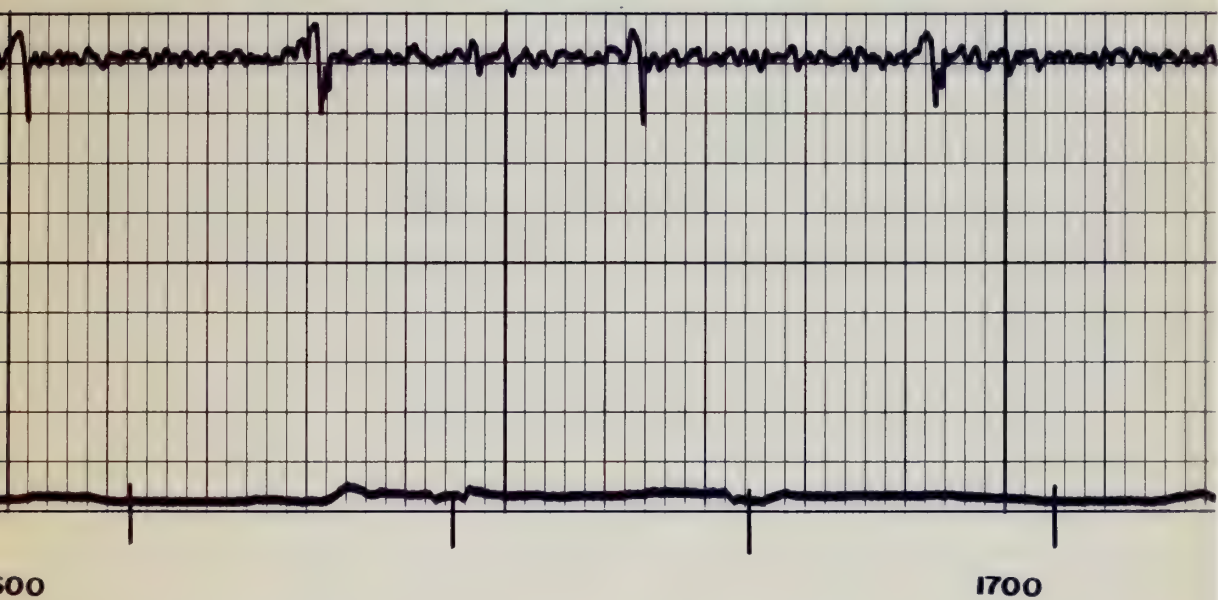
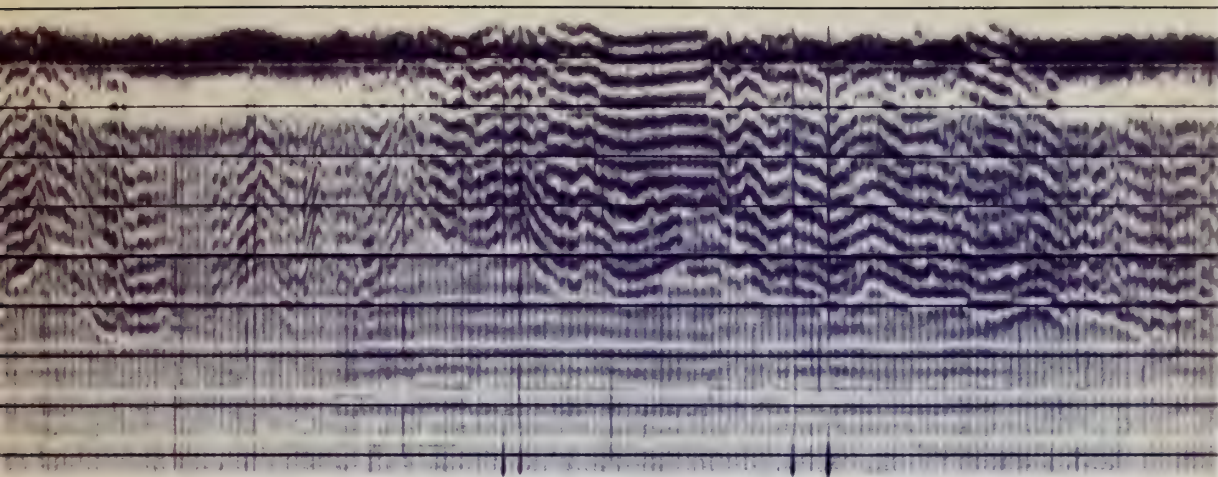


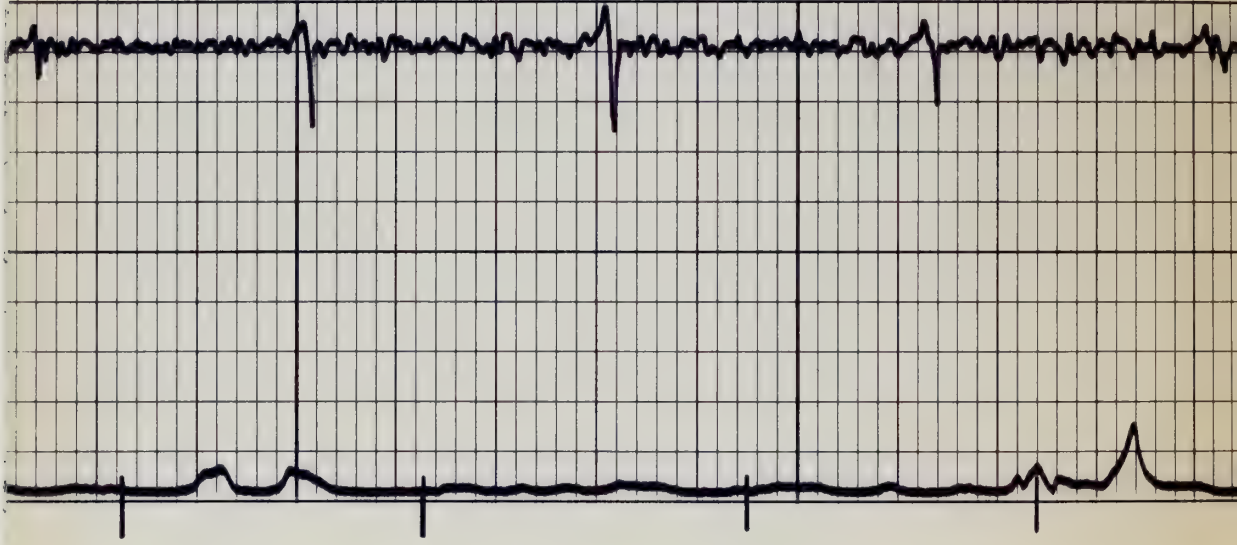
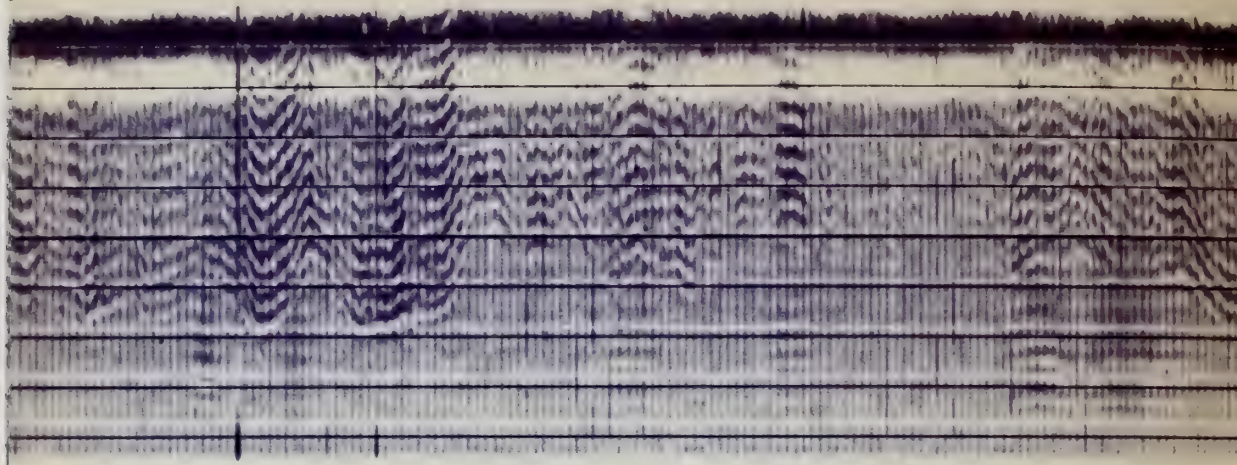


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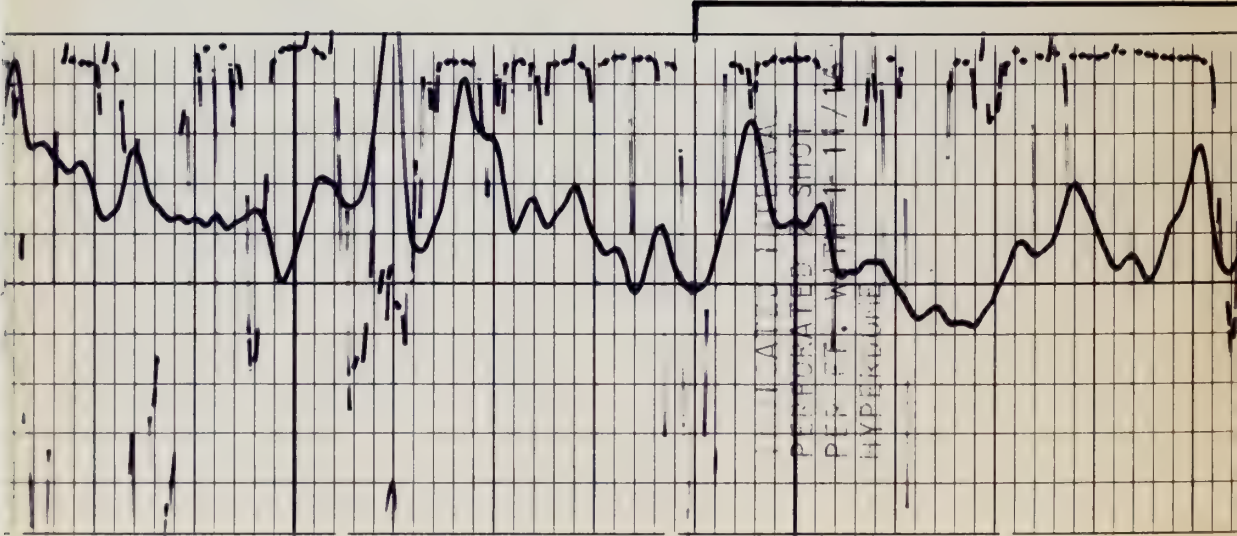


INDICATED INTERVAL
PERFORATED
SHOT
11/1/10

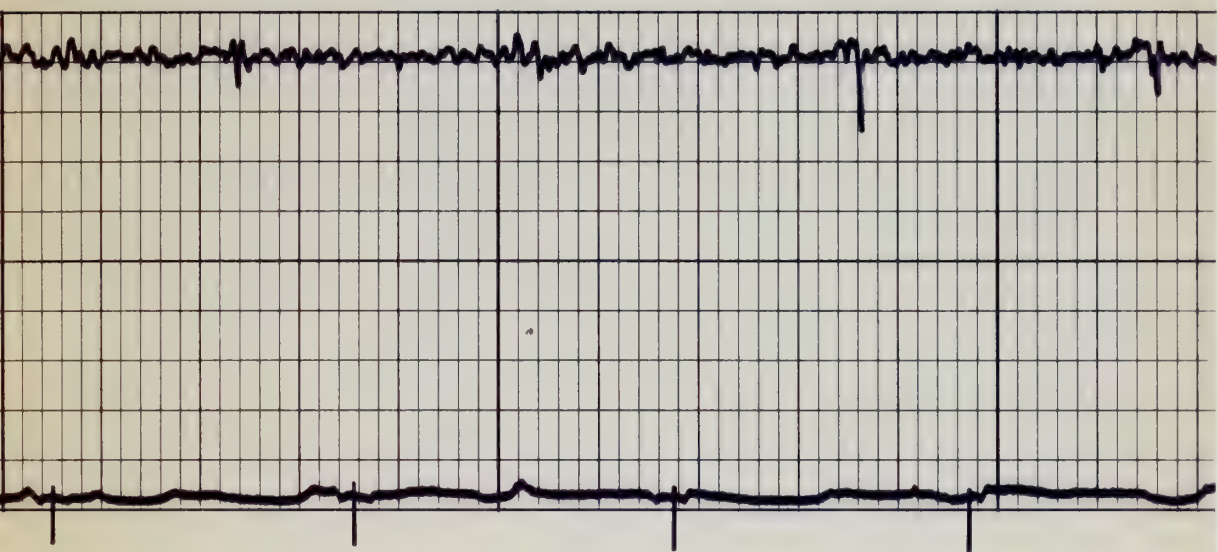
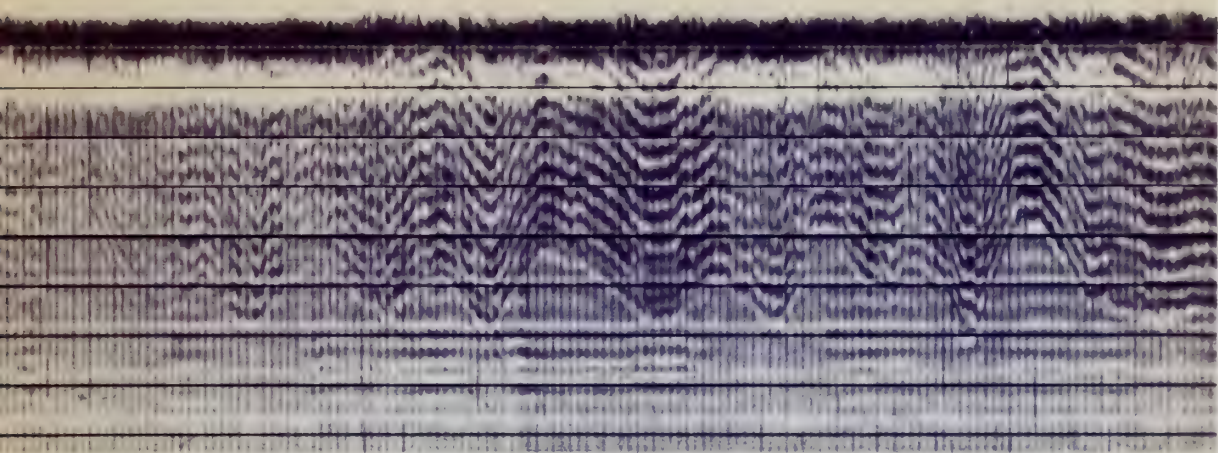




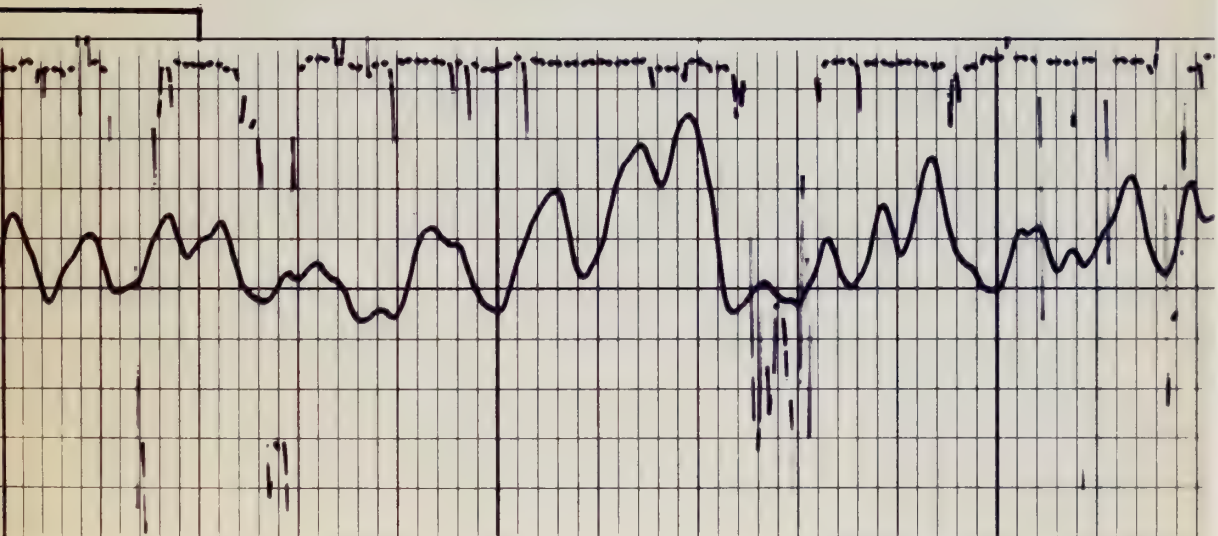
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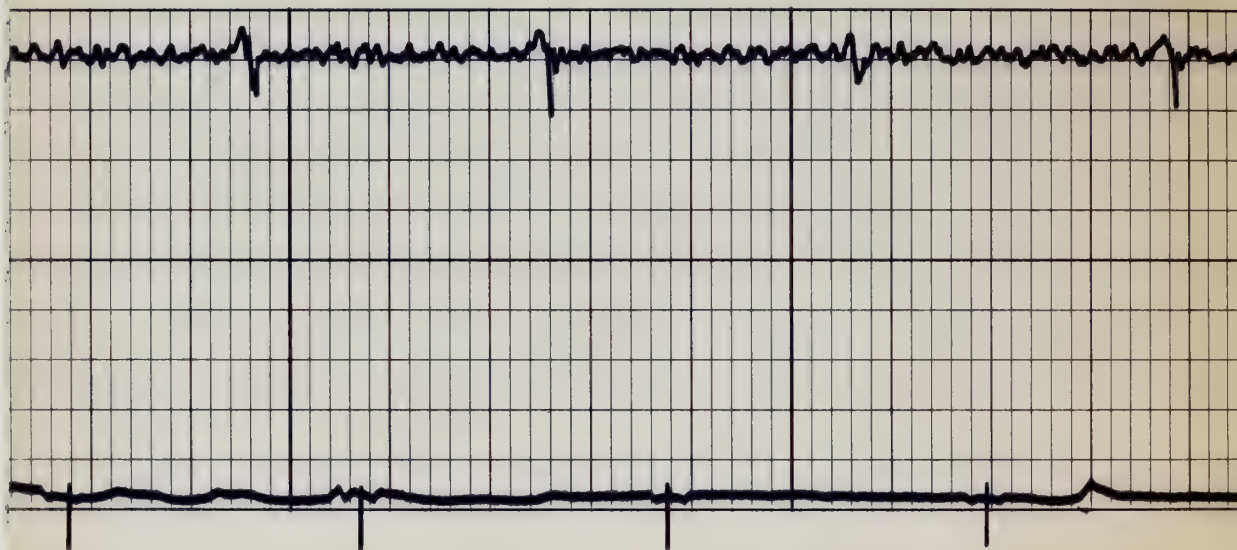
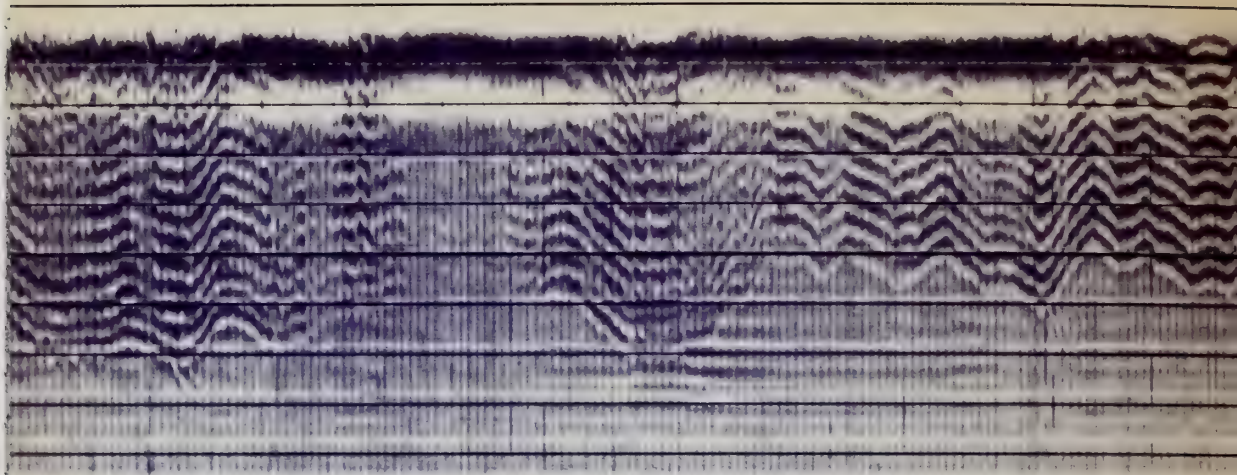


ALL INFORMATION
PERFORATED SHOT
PIV F.P. W/TH 1-11/16
HYPERKUBINE

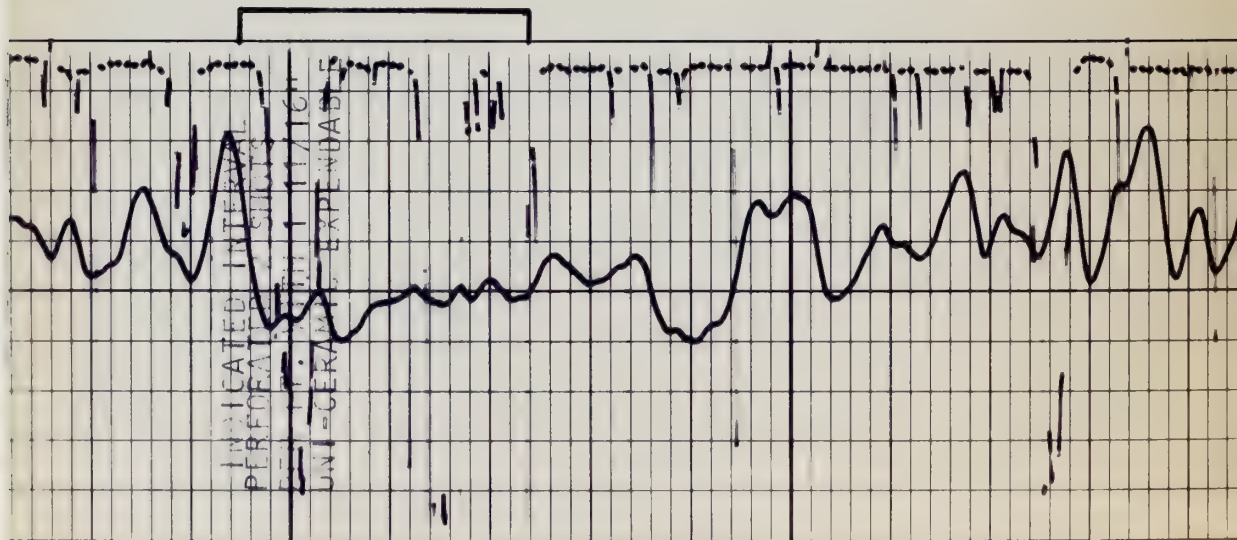


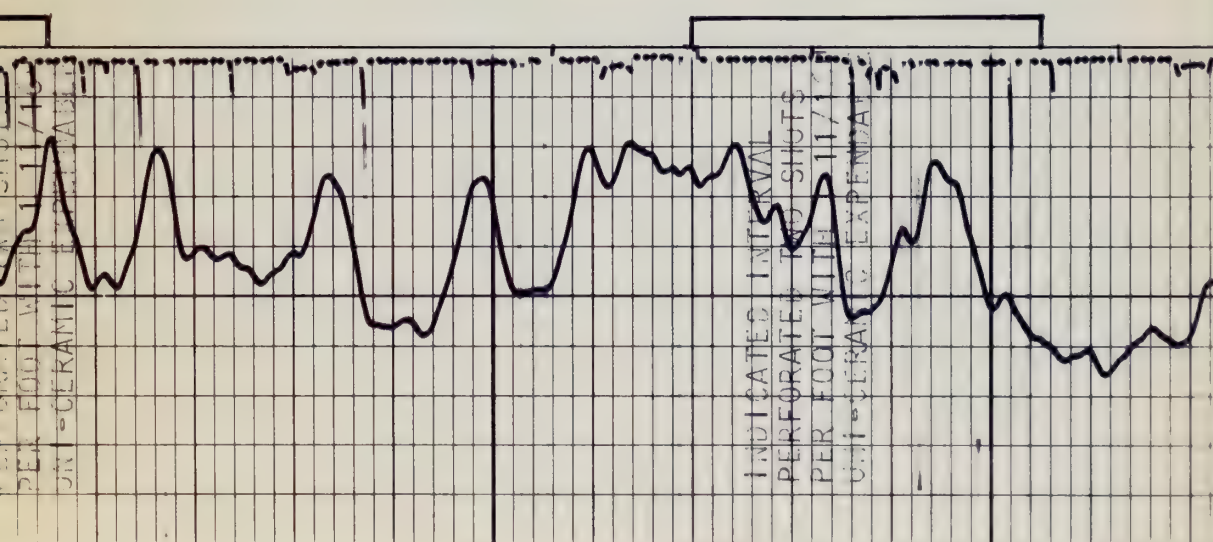
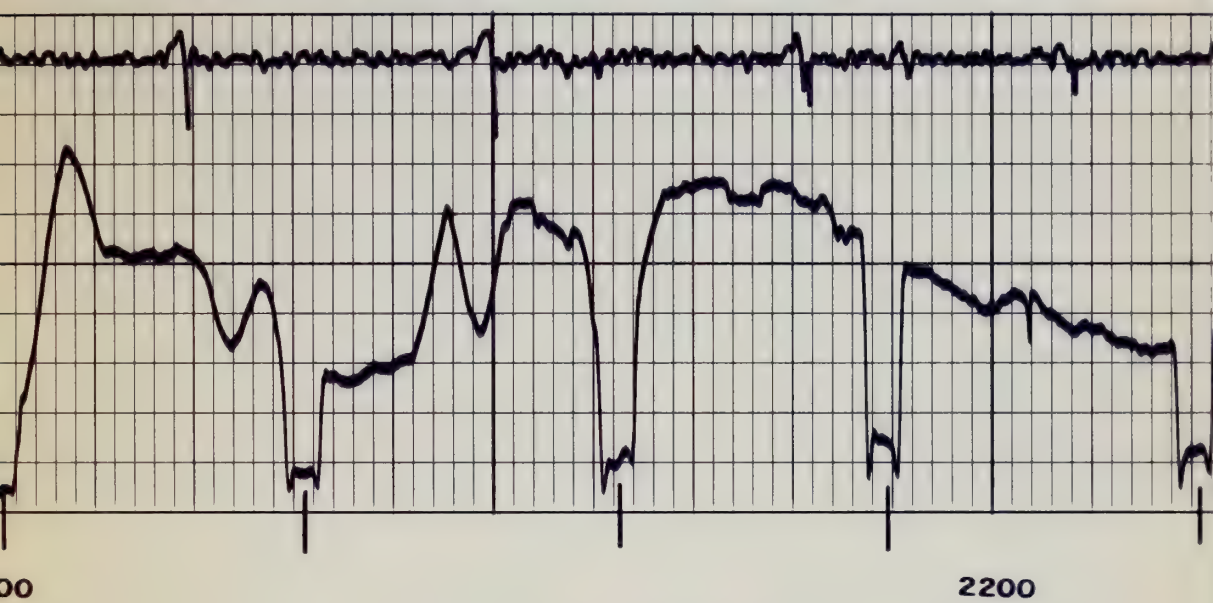
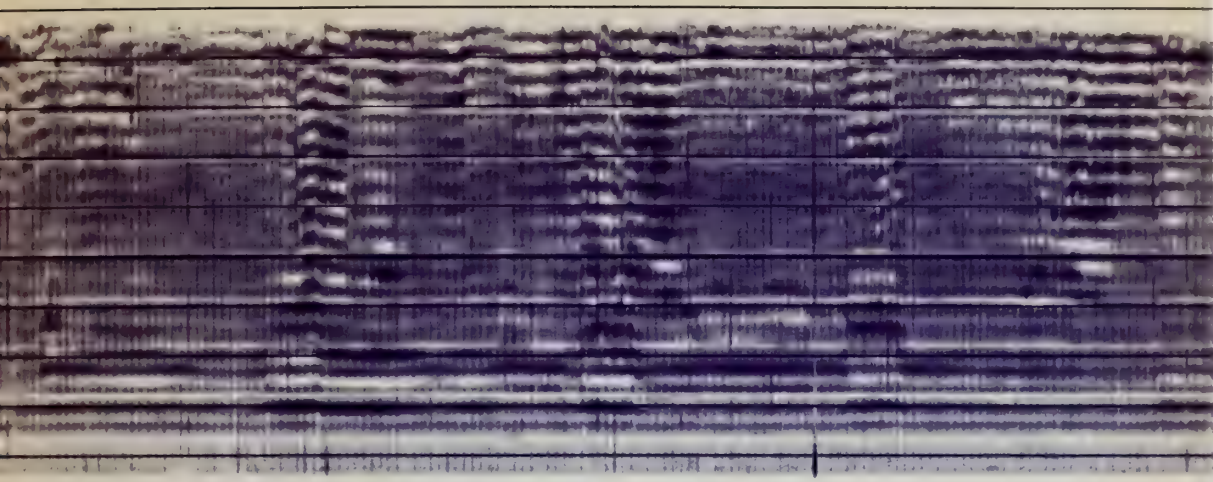
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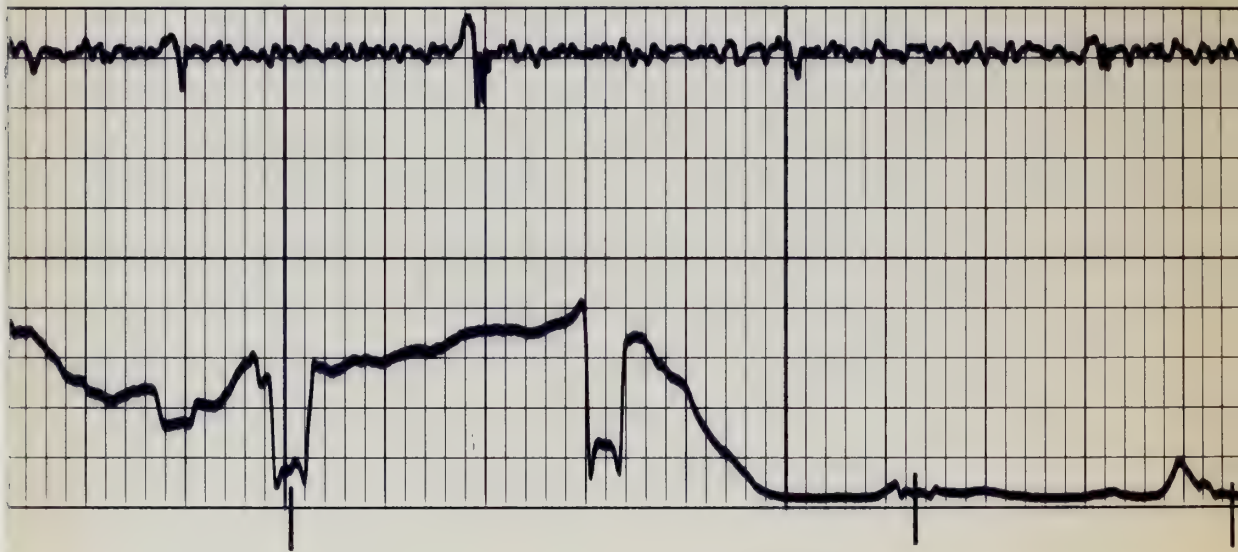
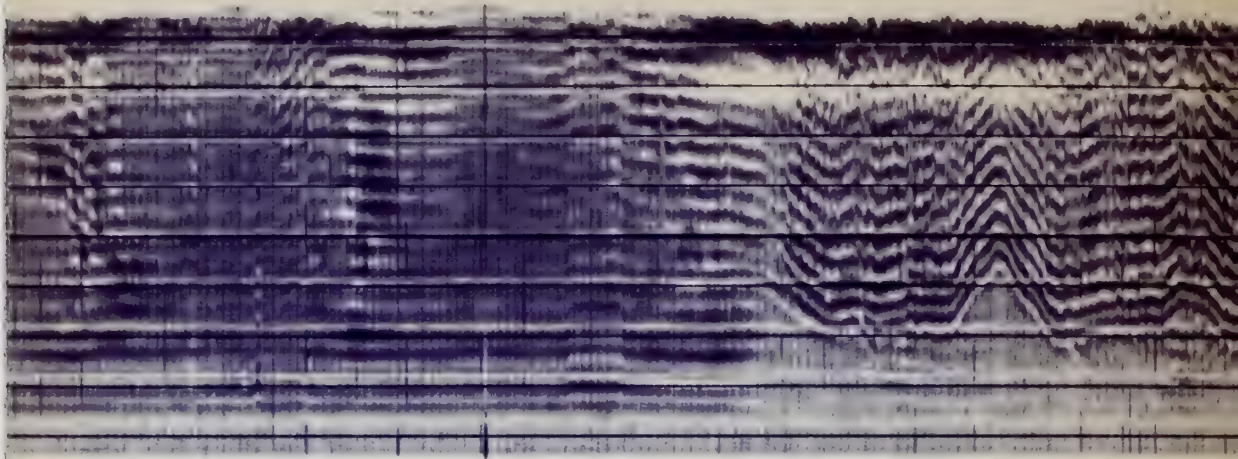




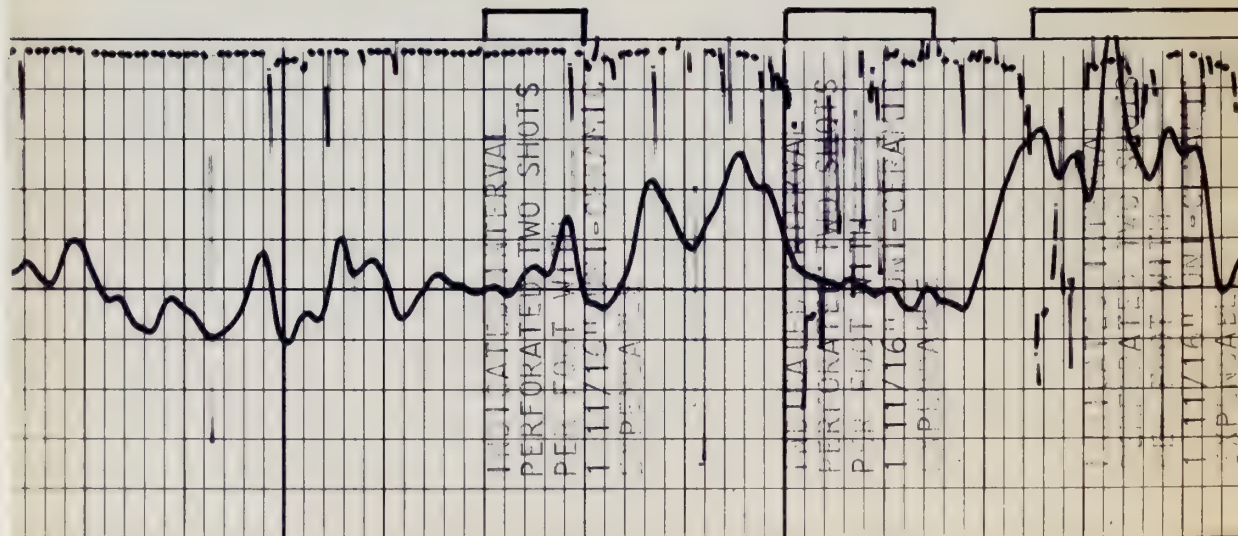
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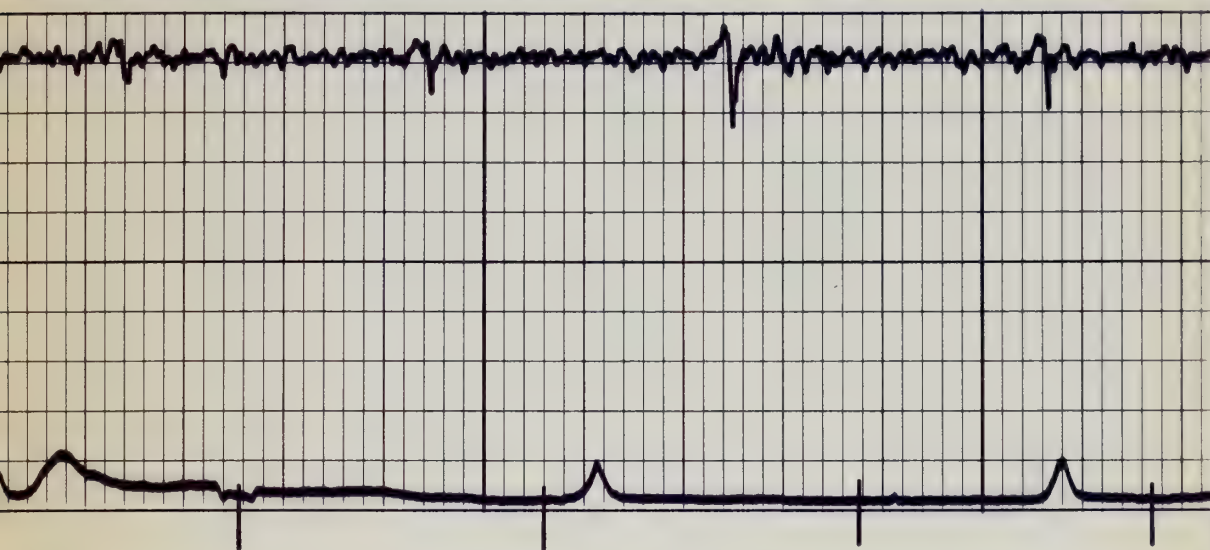
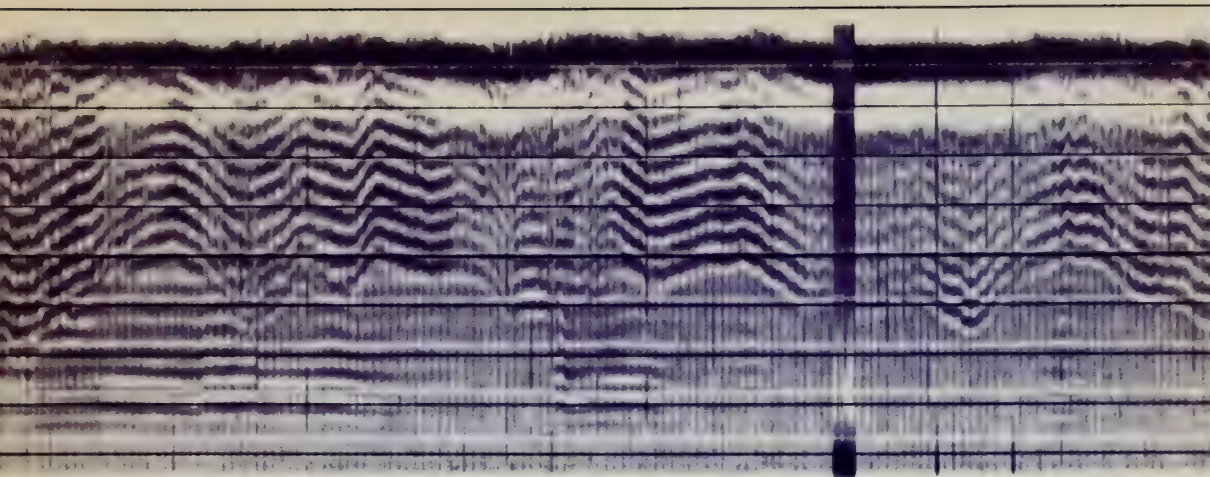




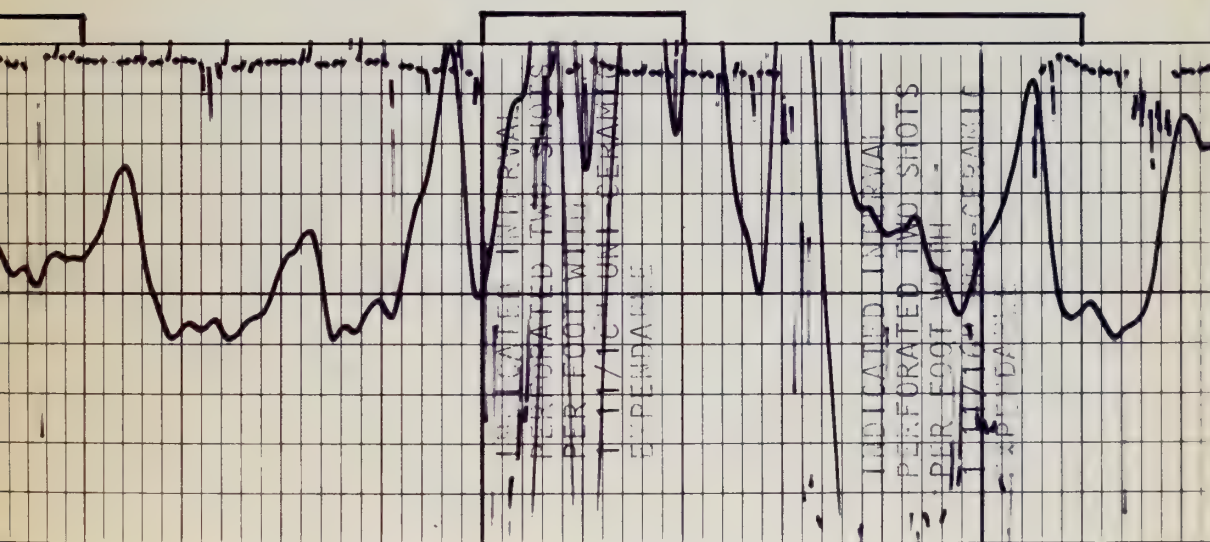


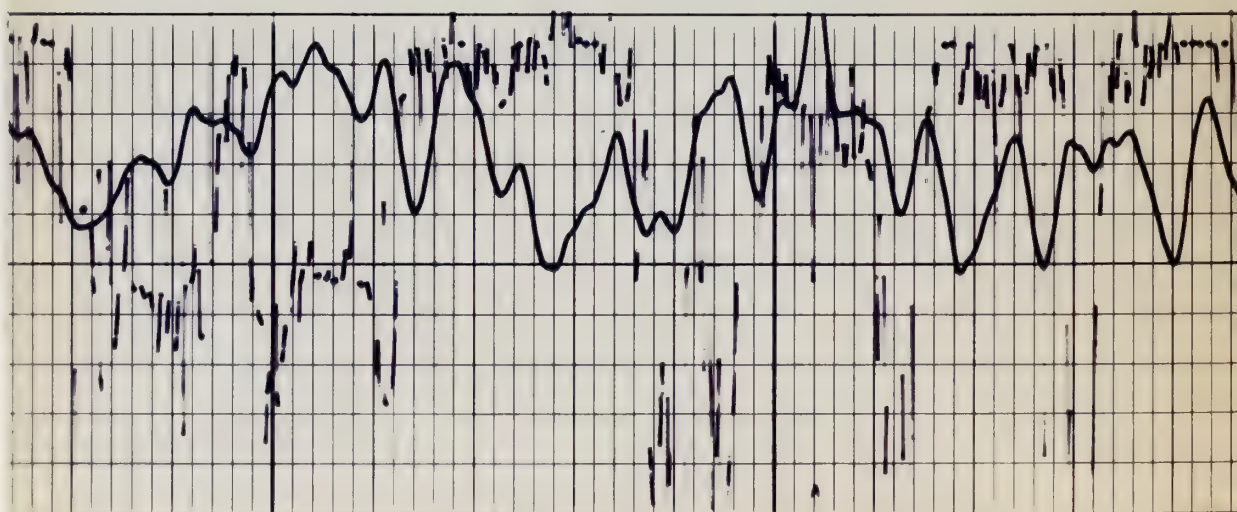
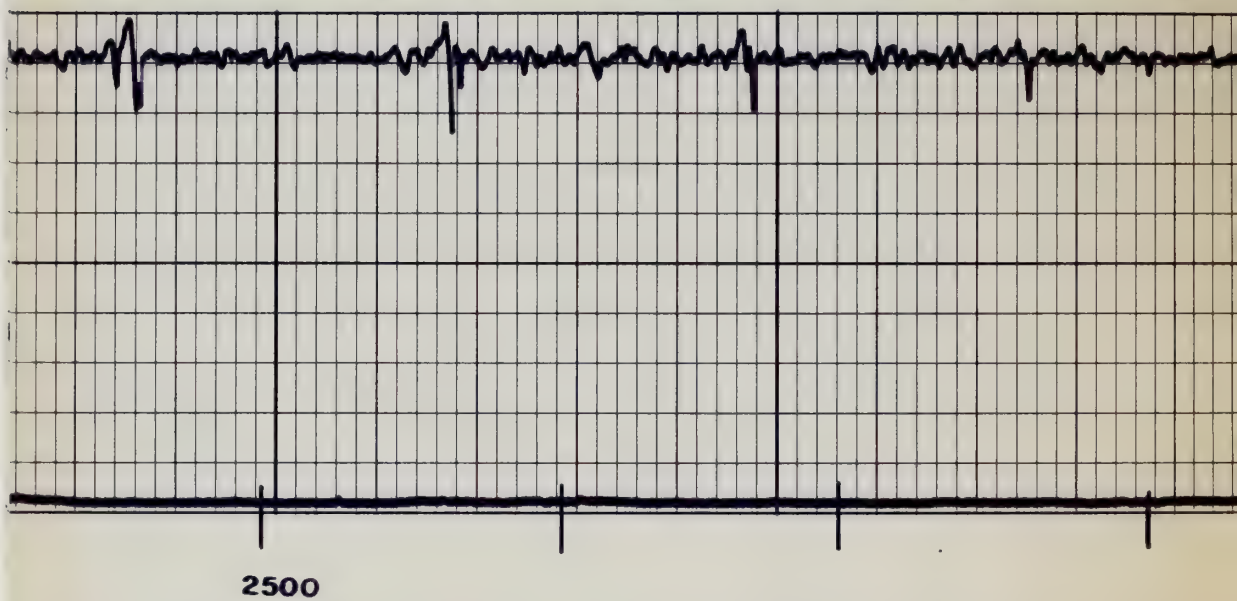
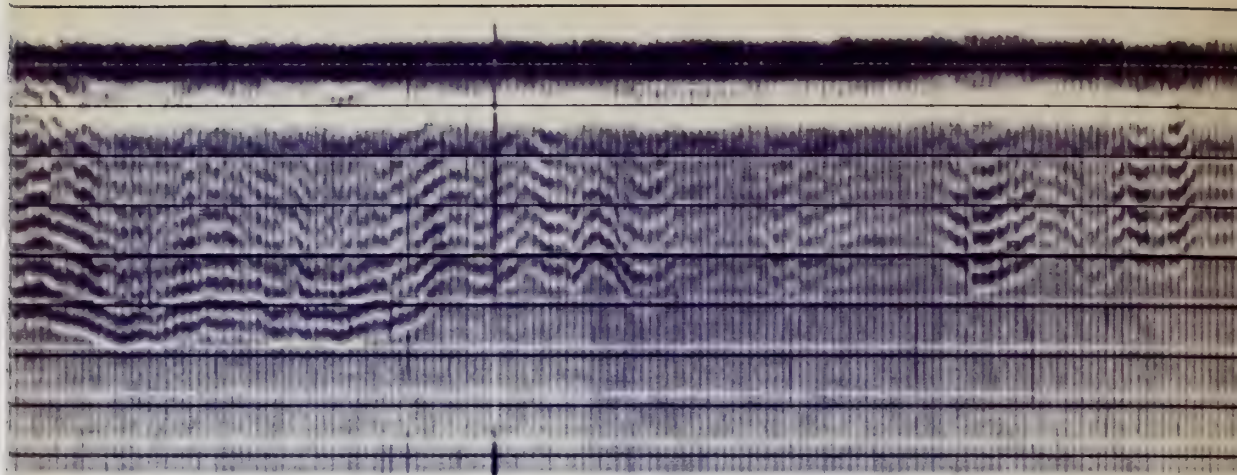
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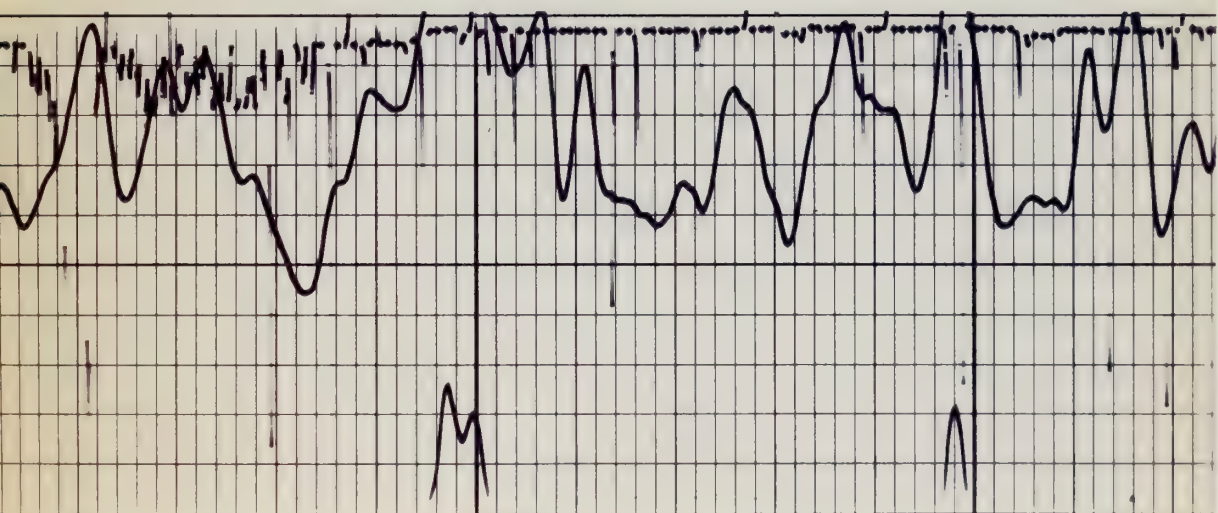
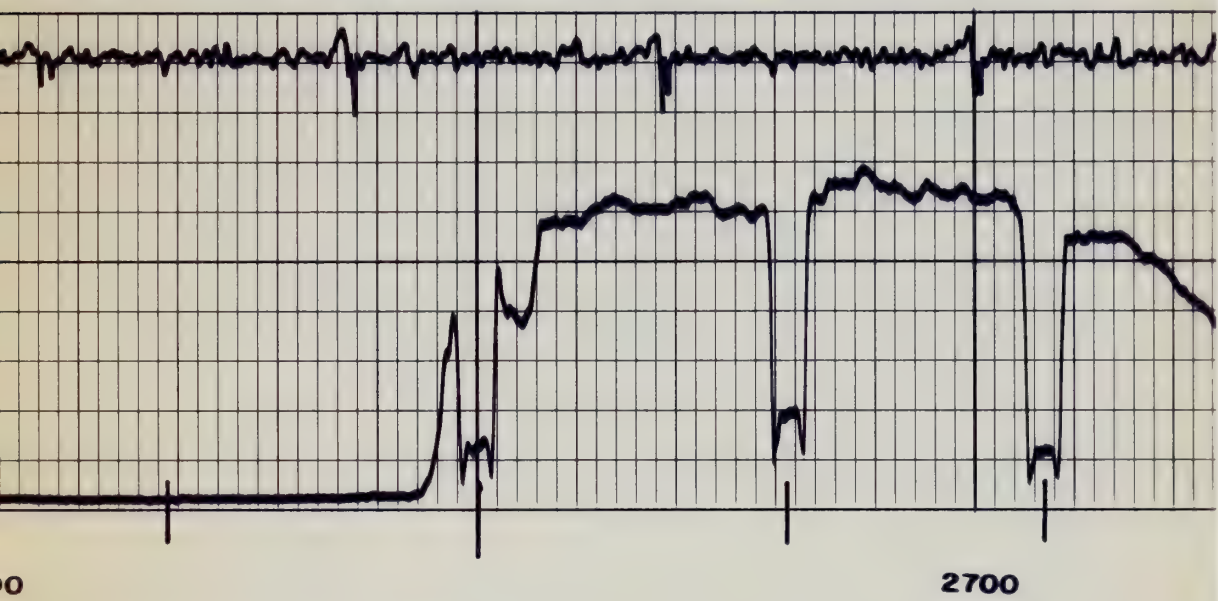
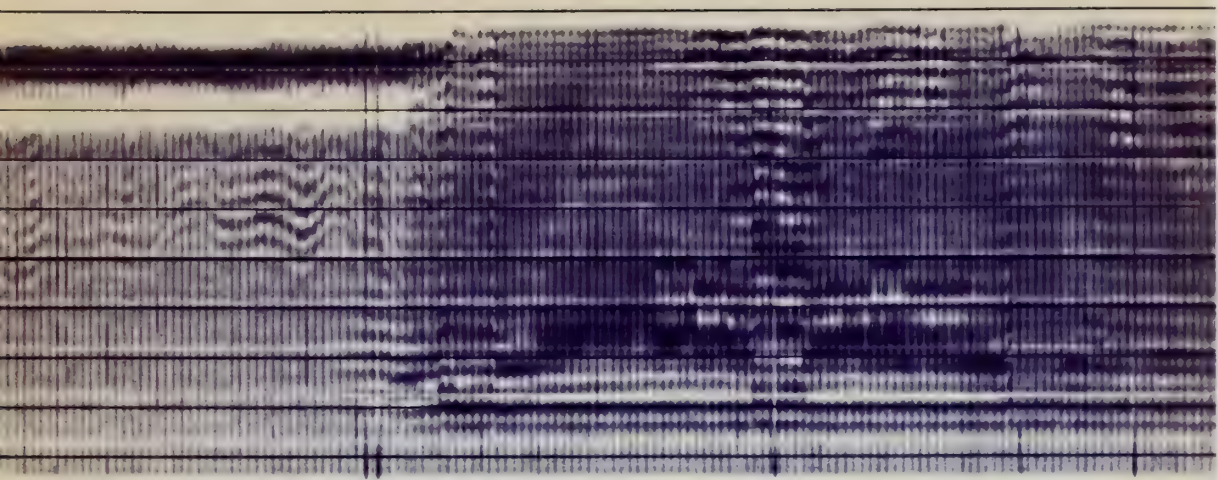


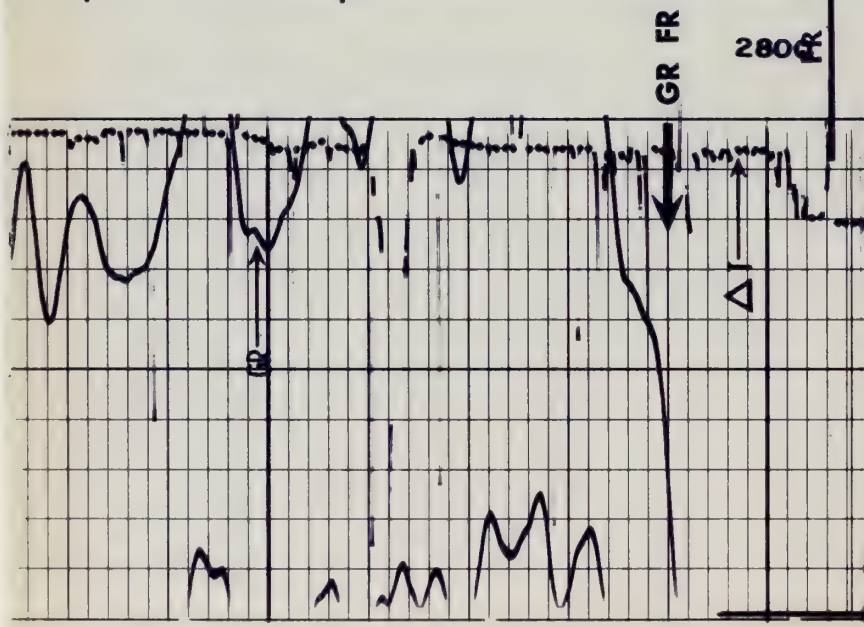
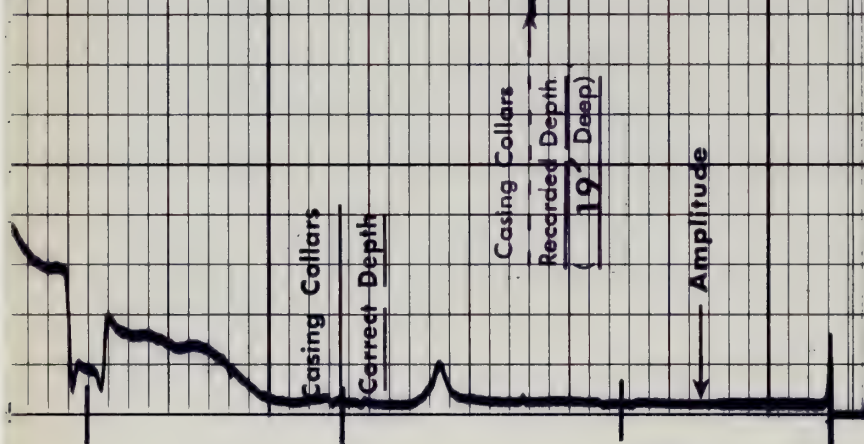
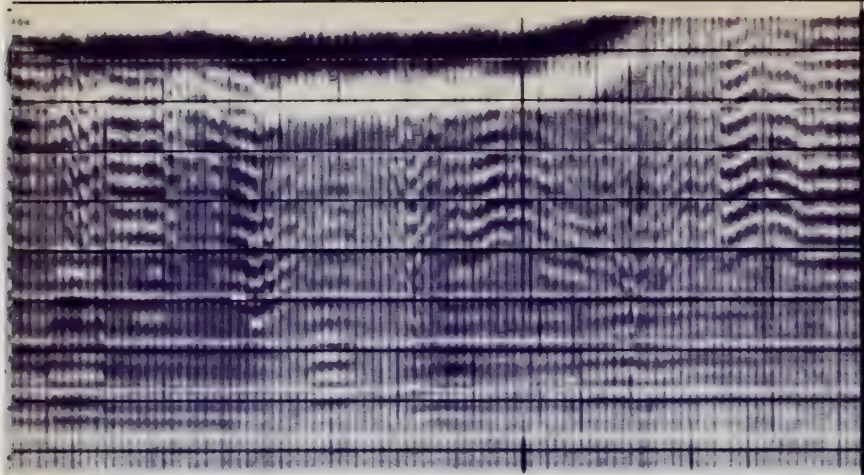


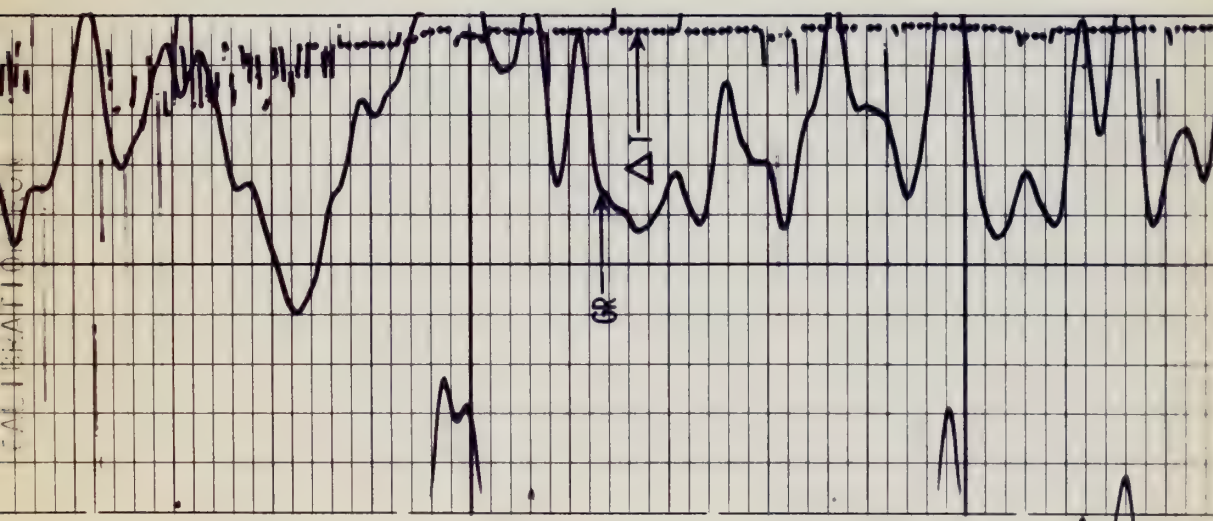
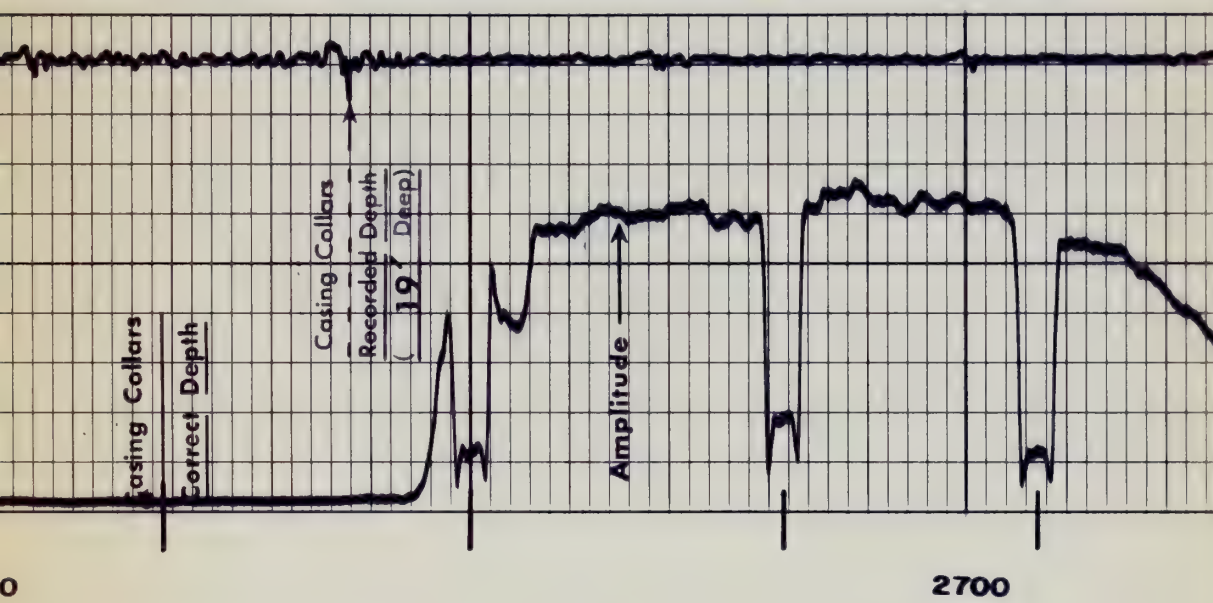
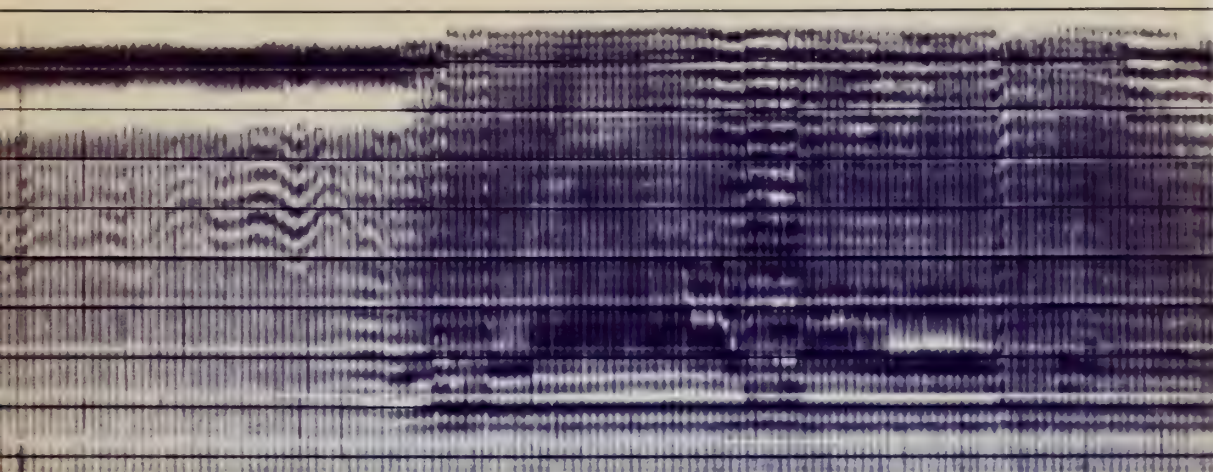
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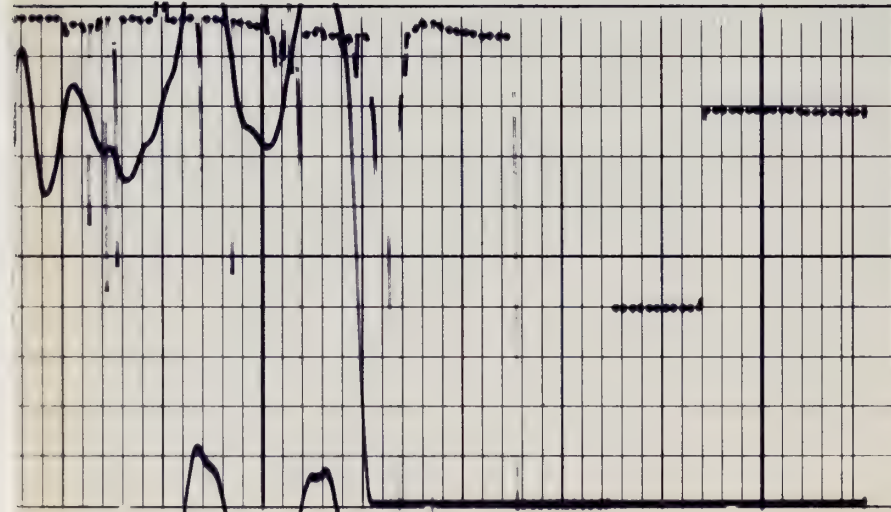
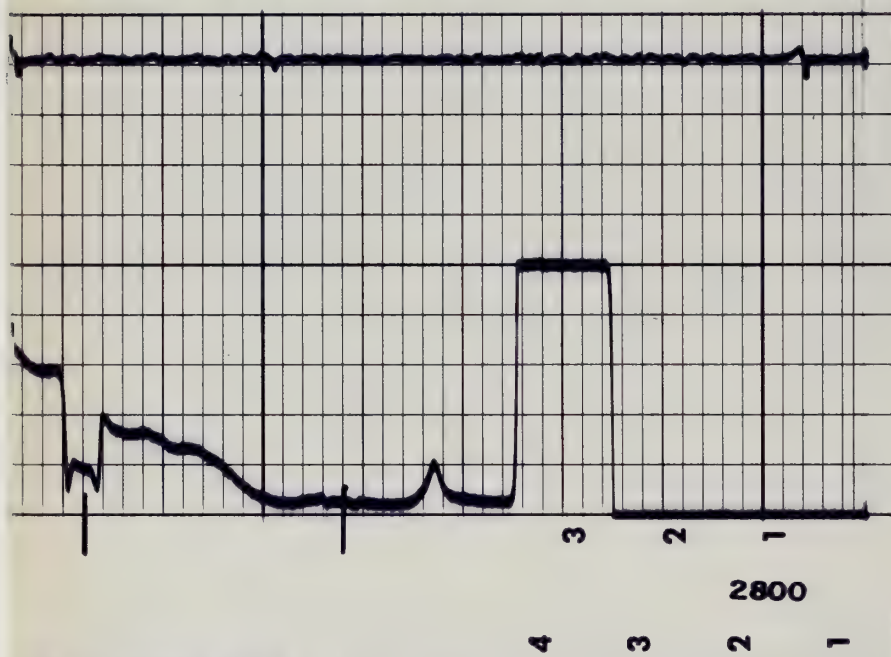
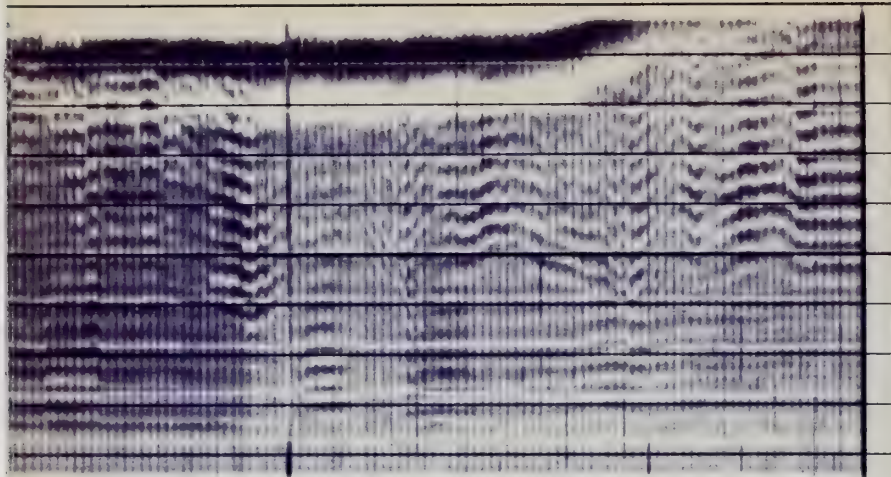


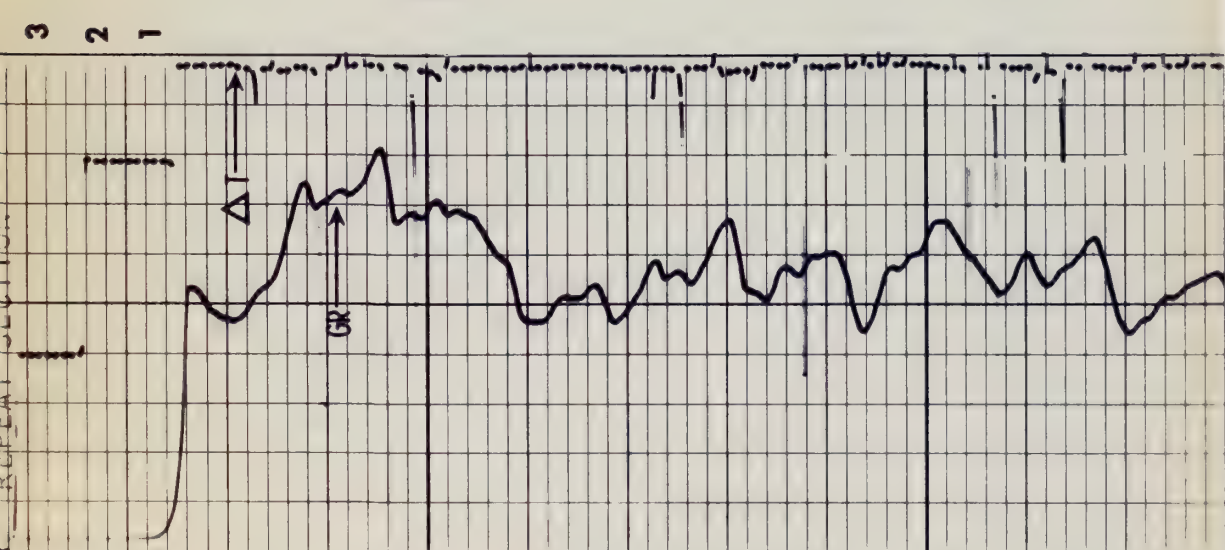
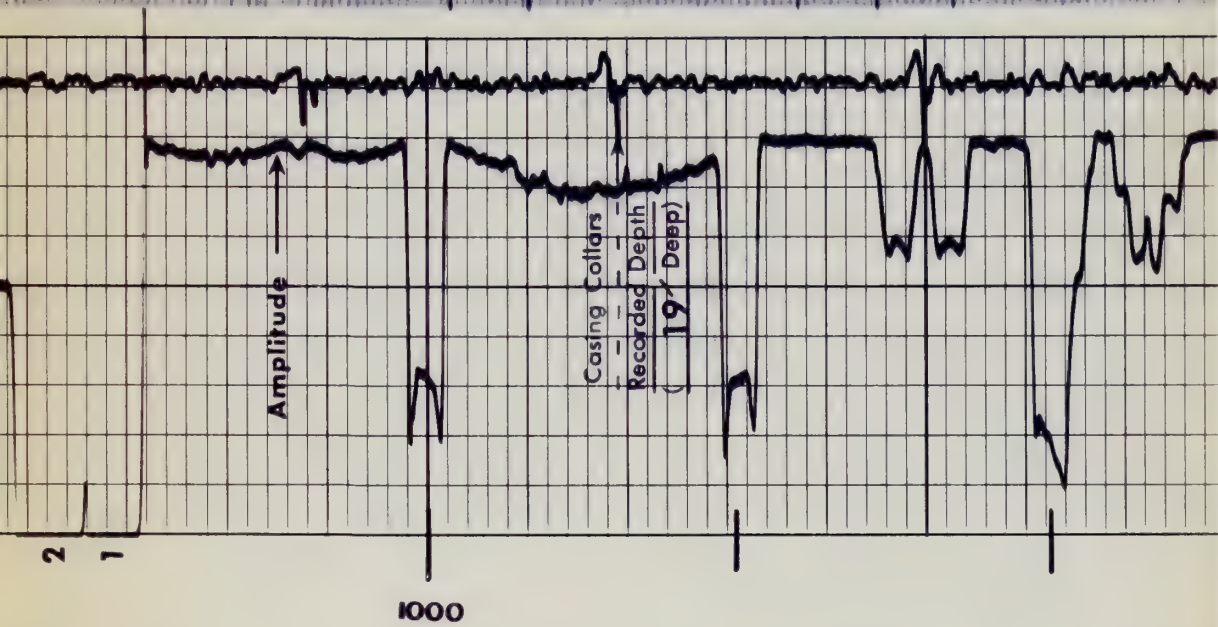
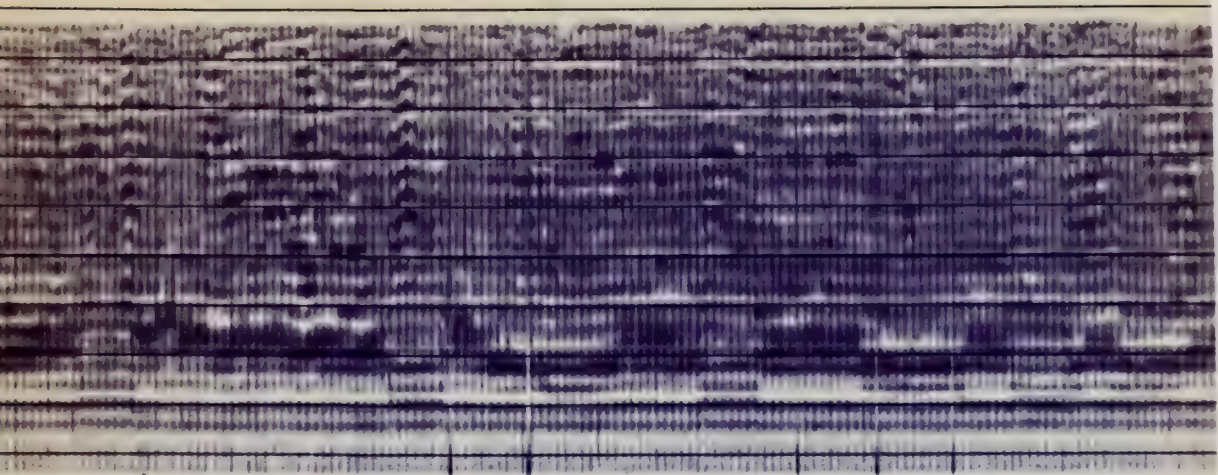


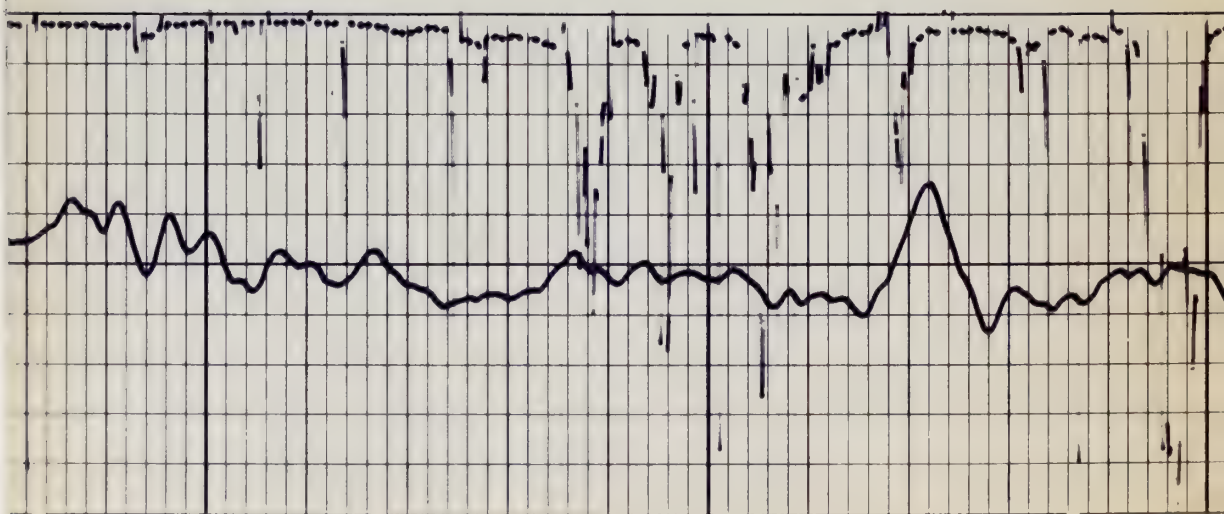
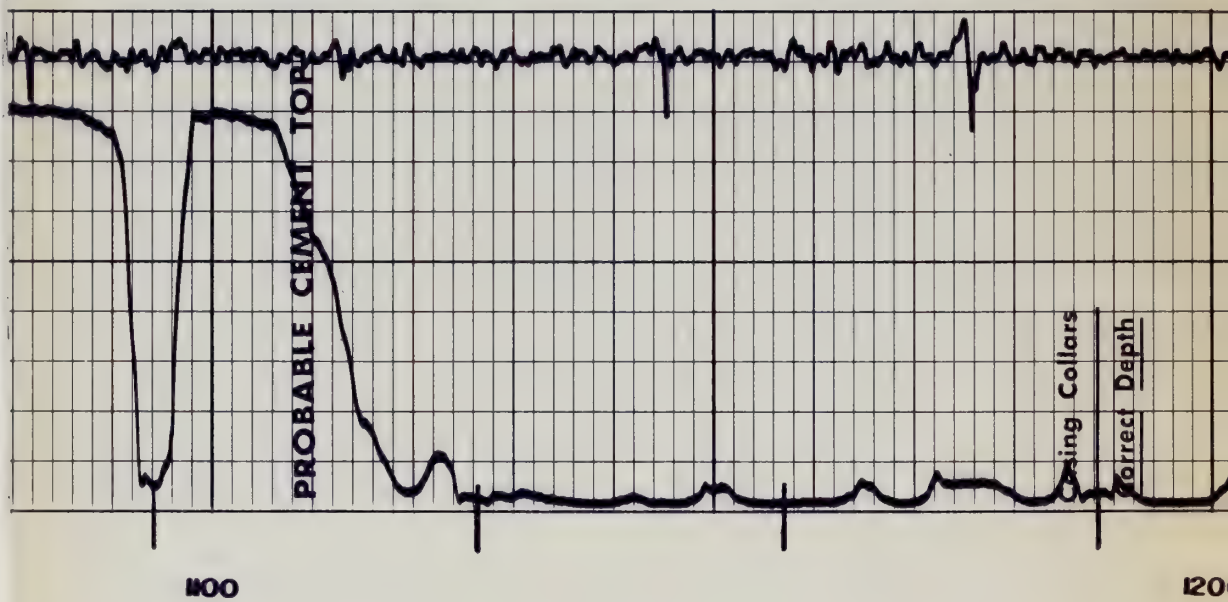
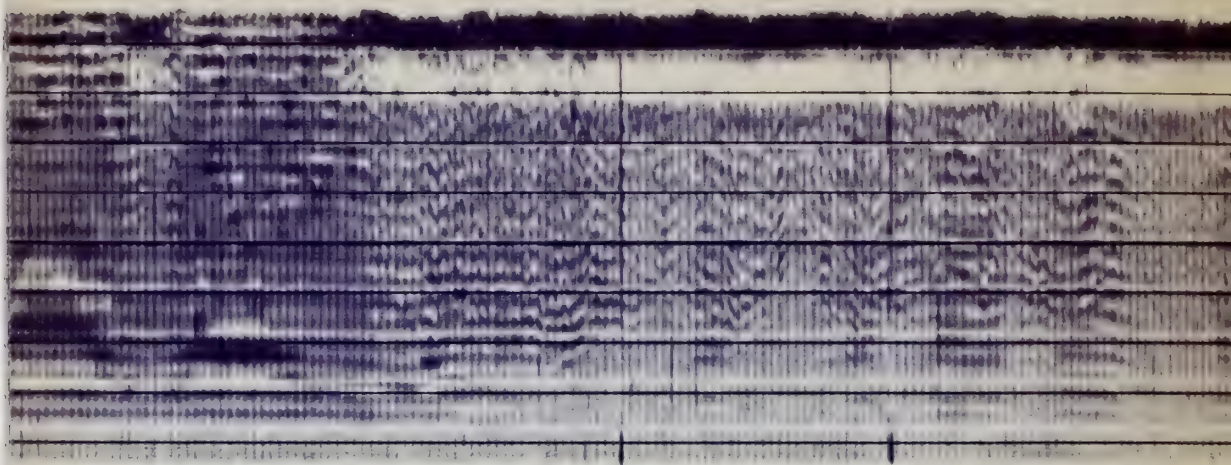


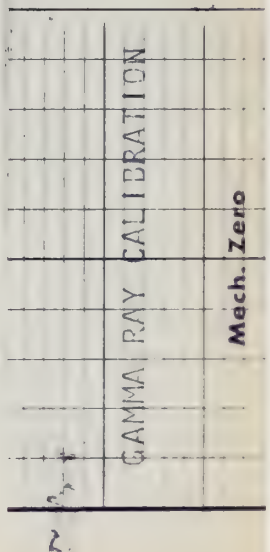
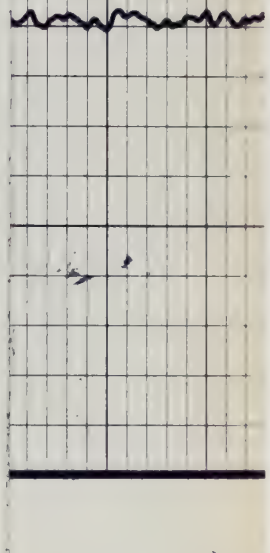
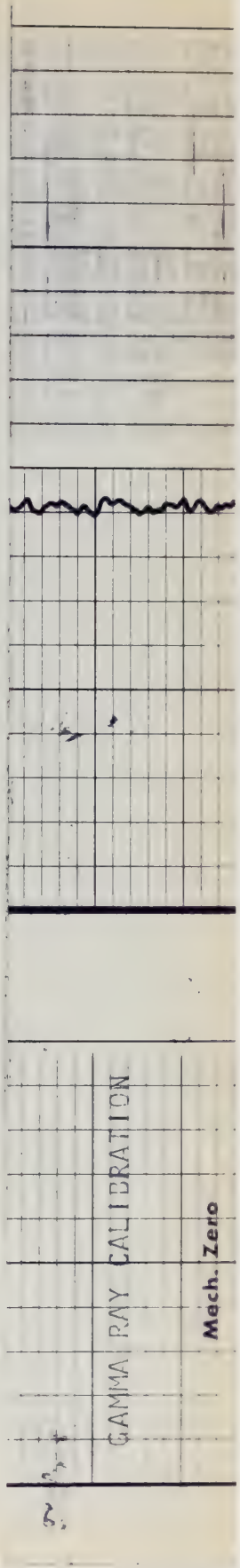
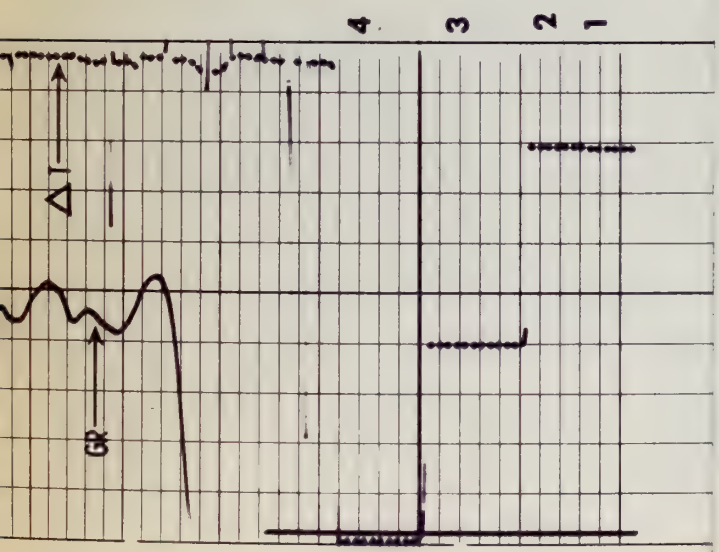
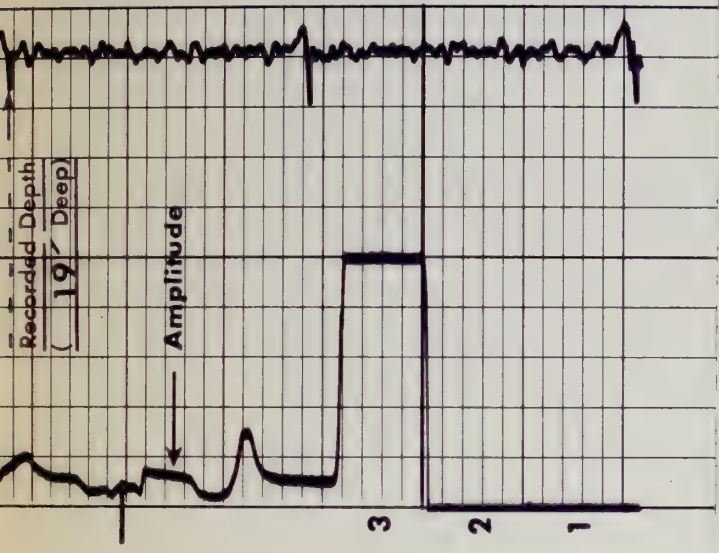
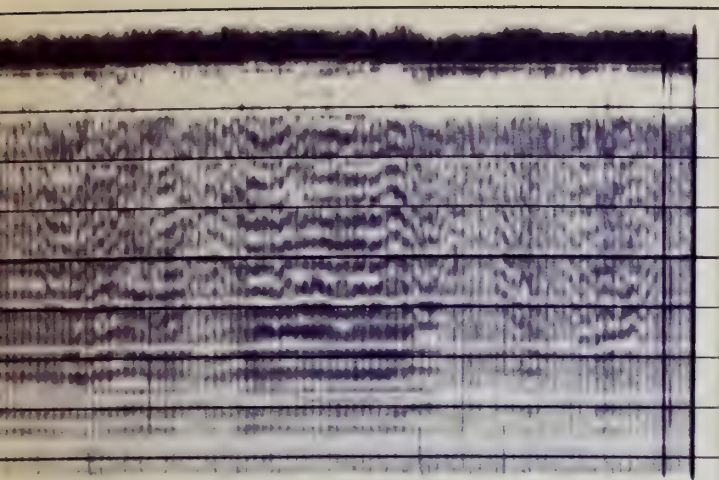


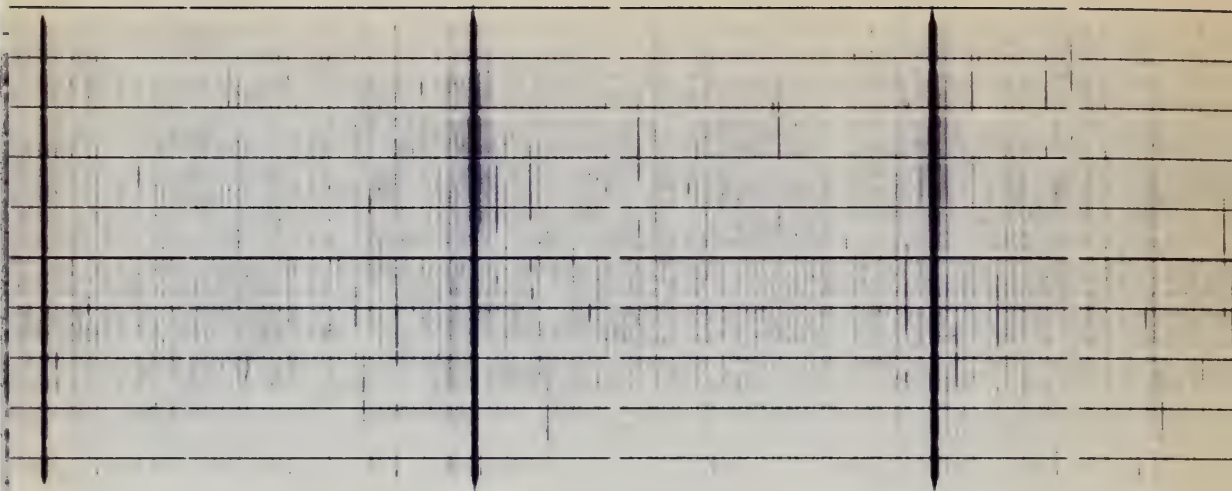




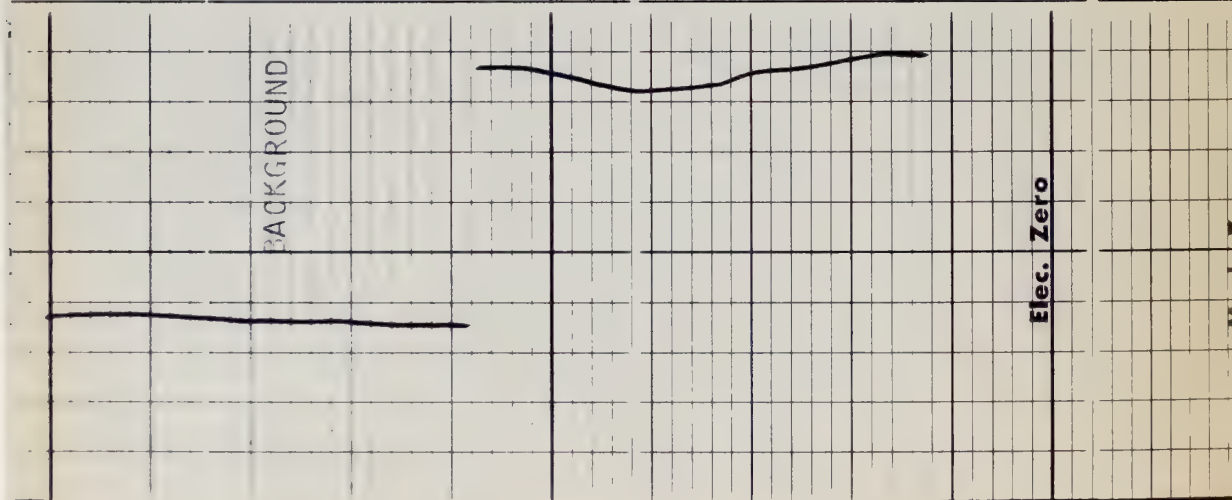


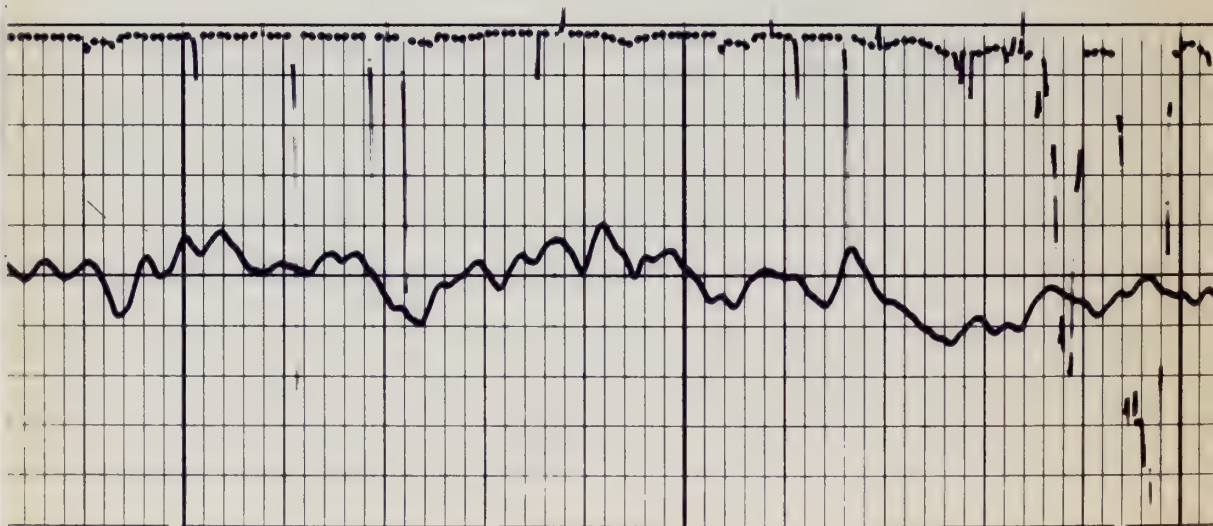
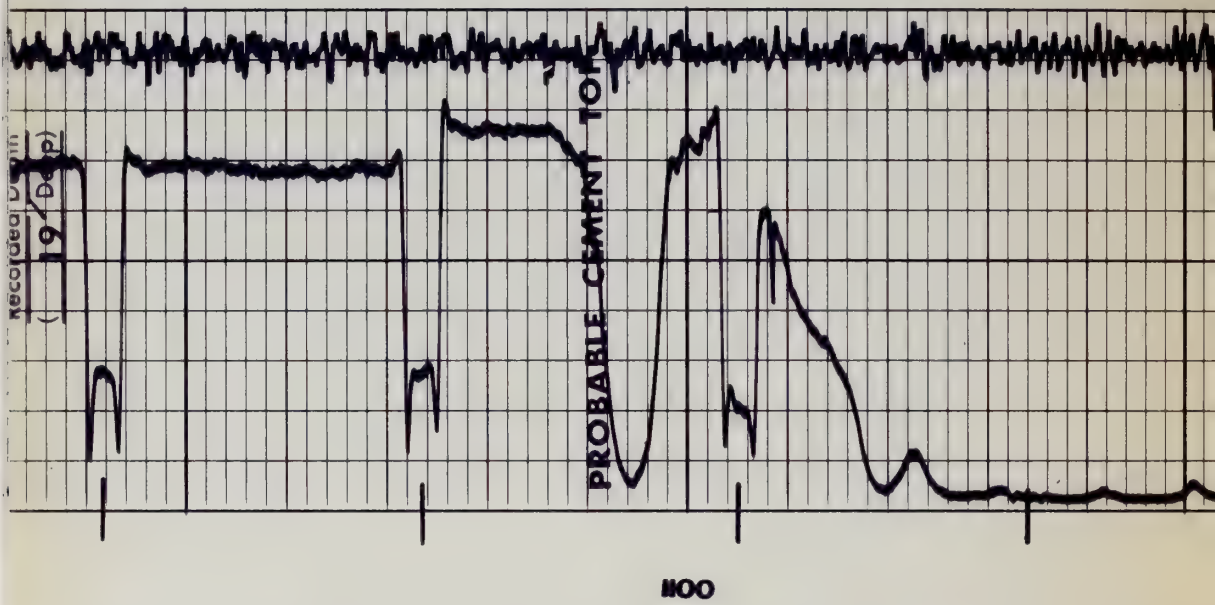
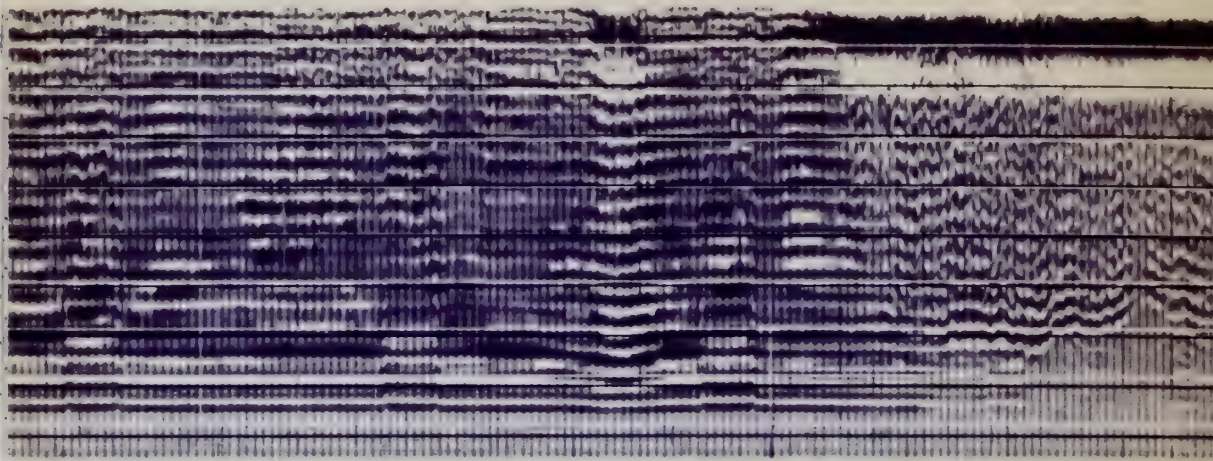


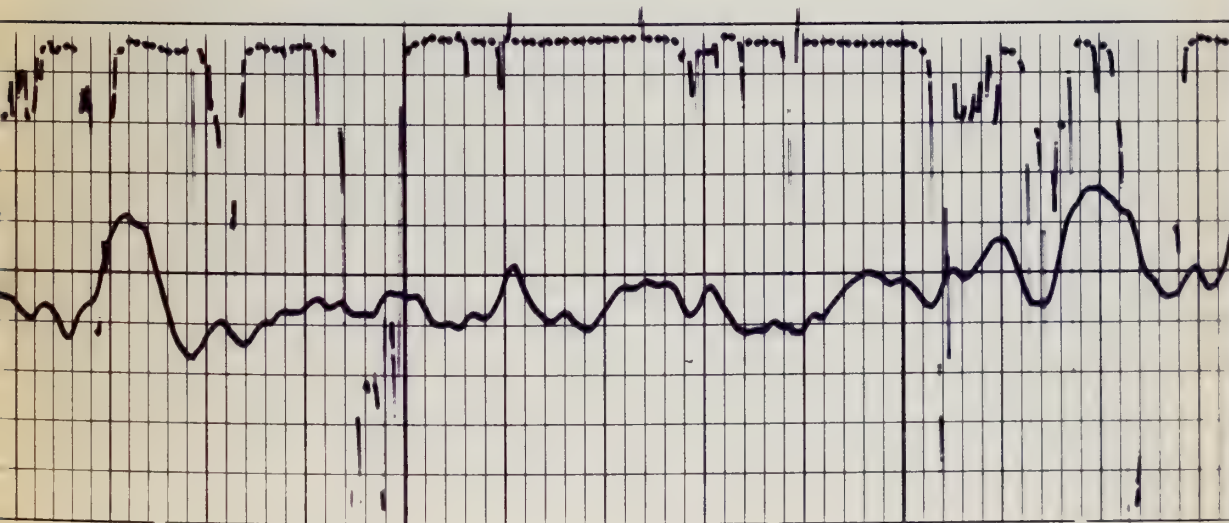
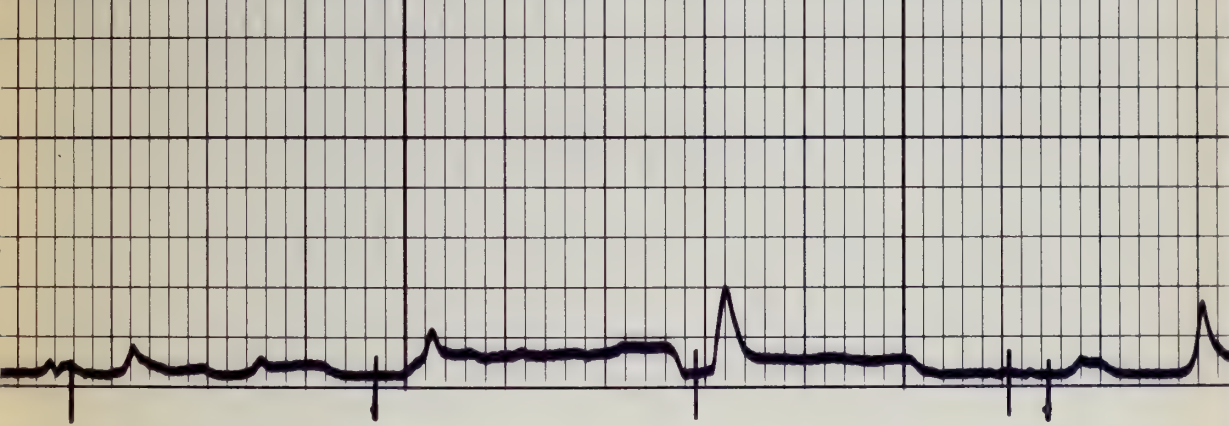
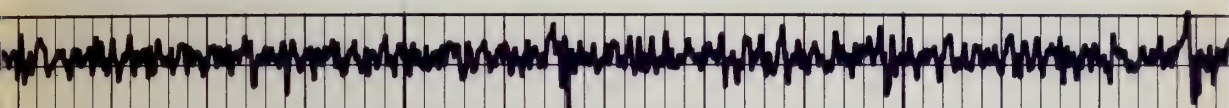
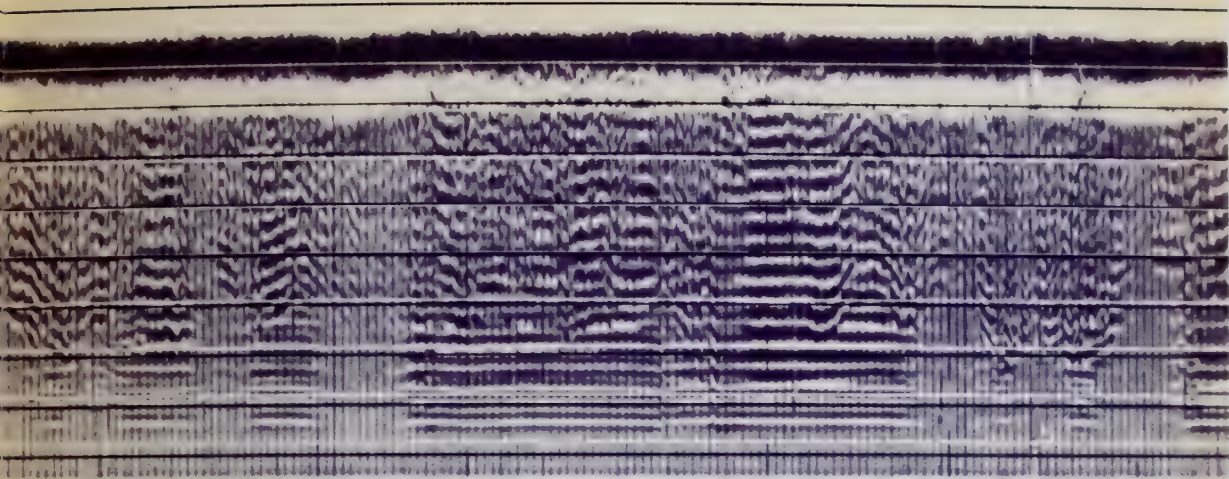


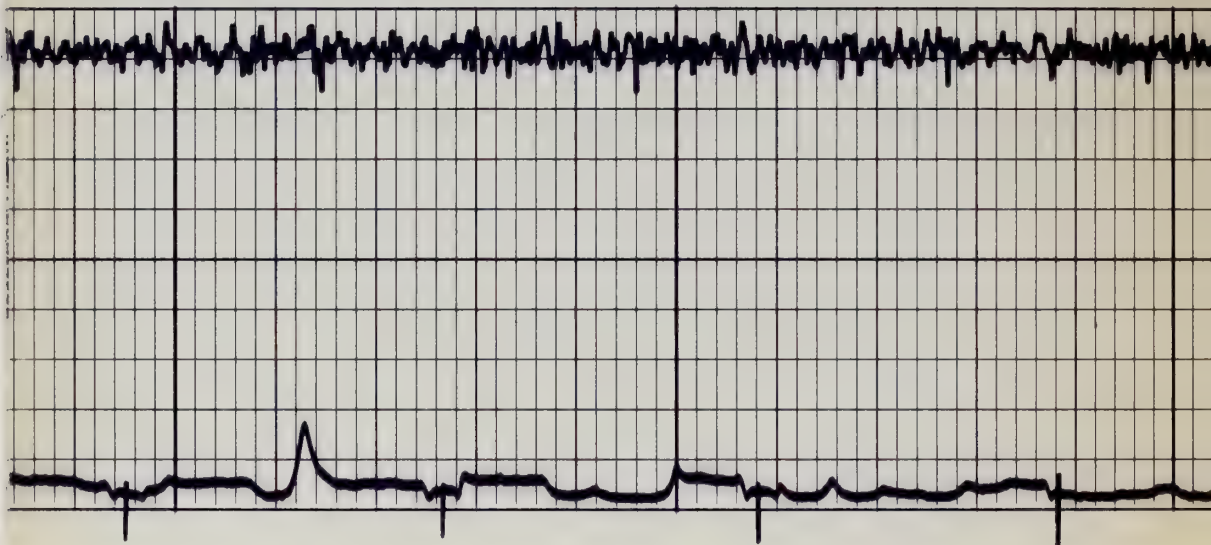
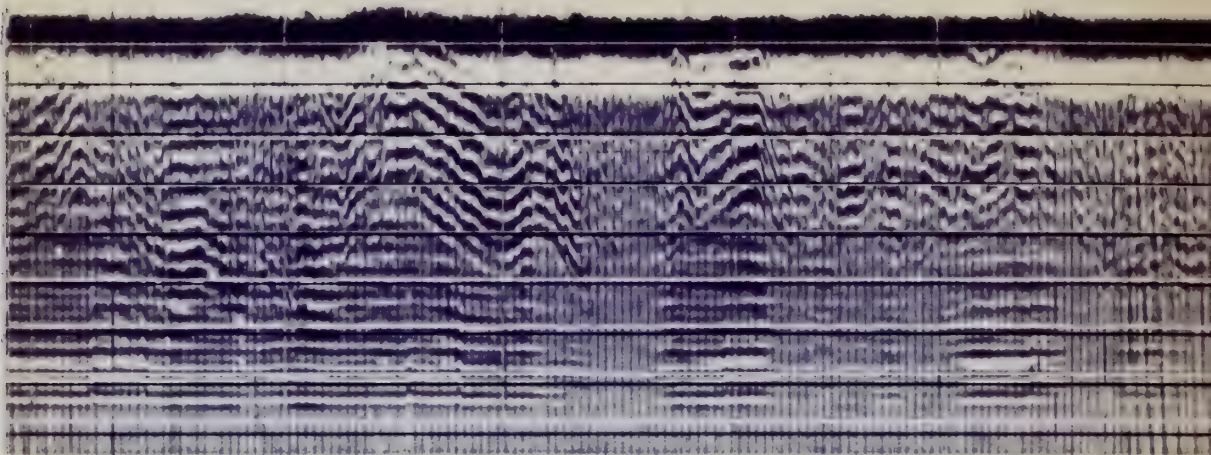


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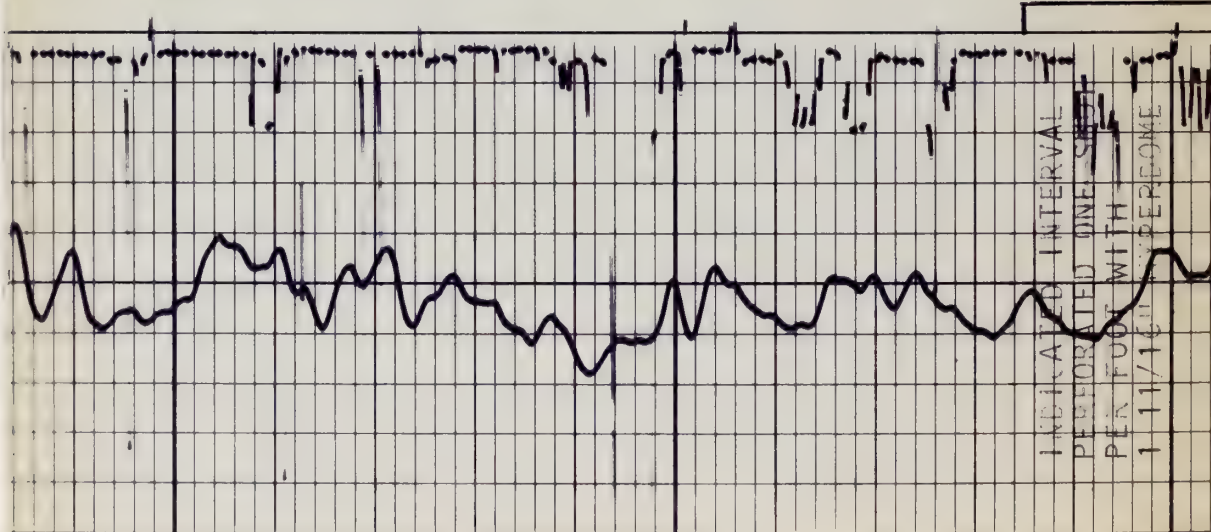




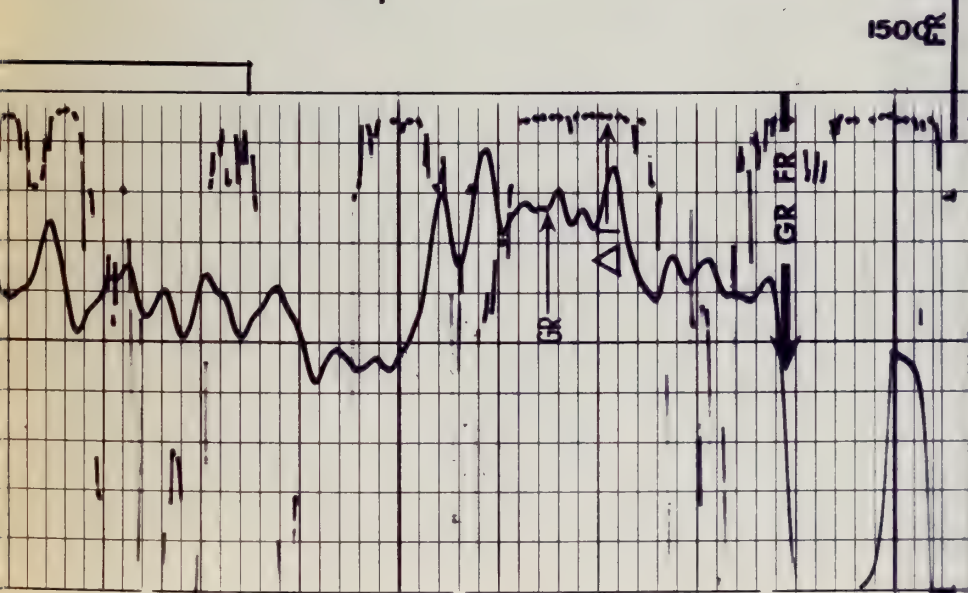
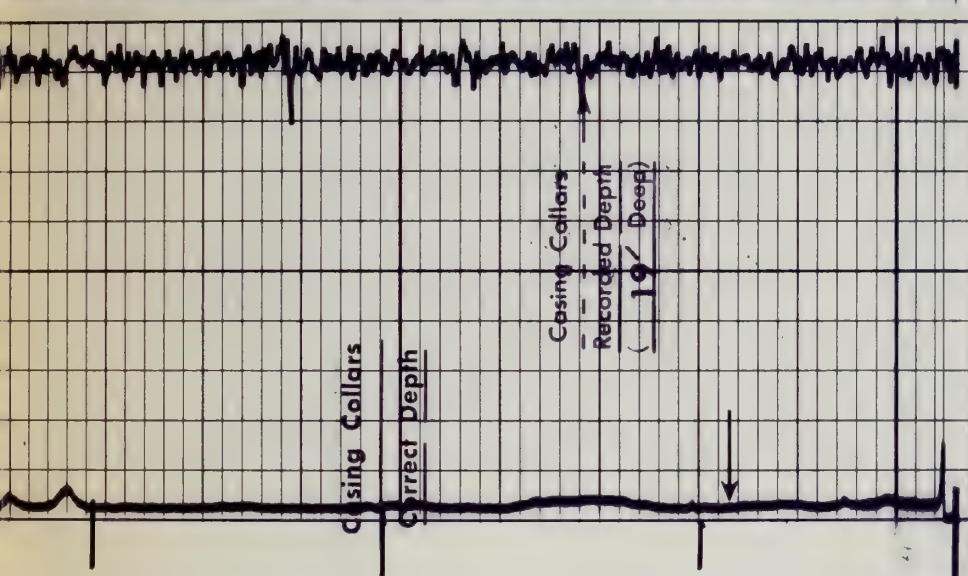
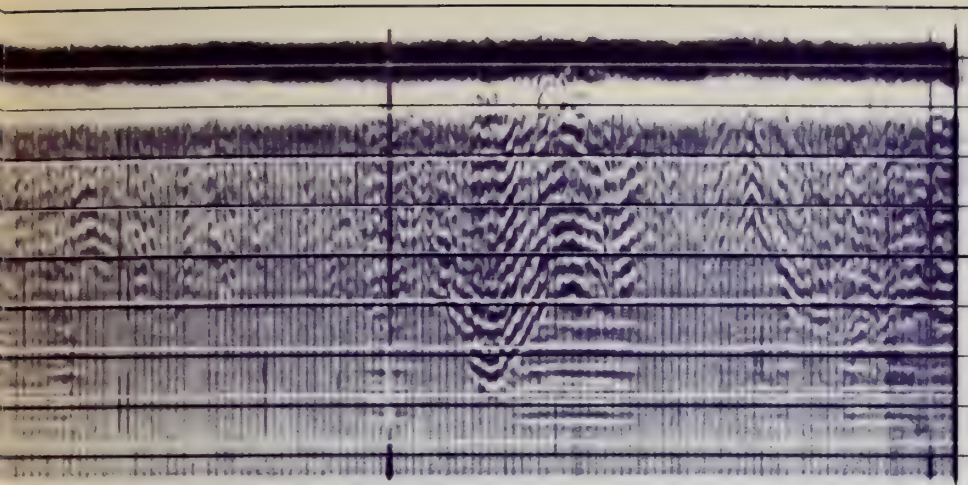


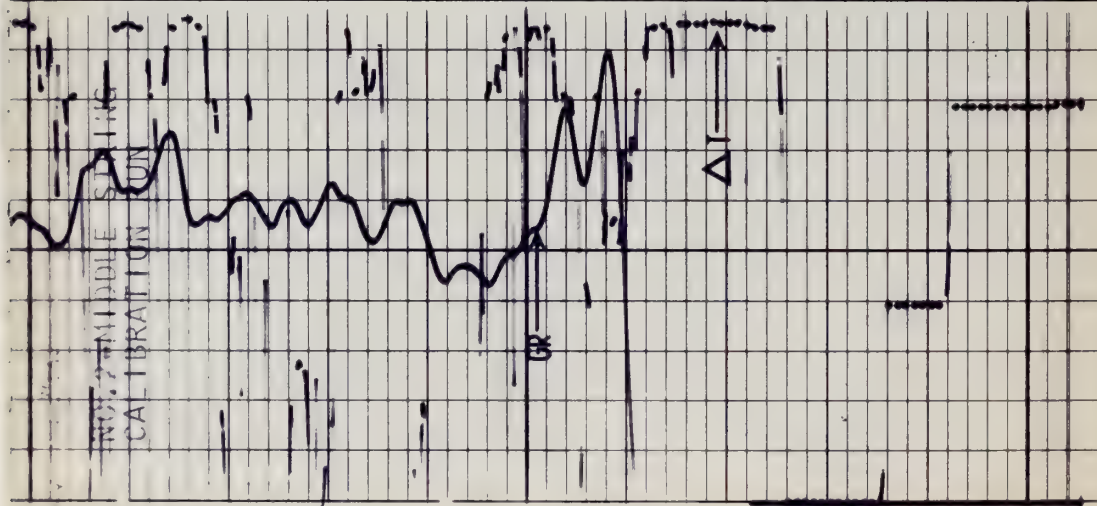
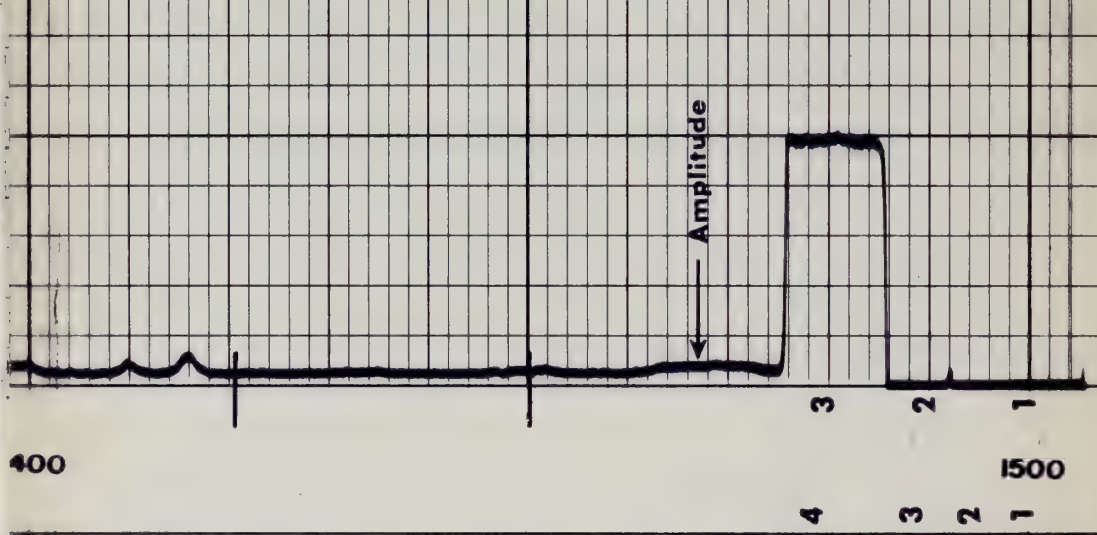
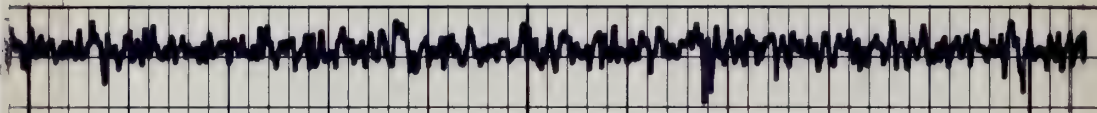
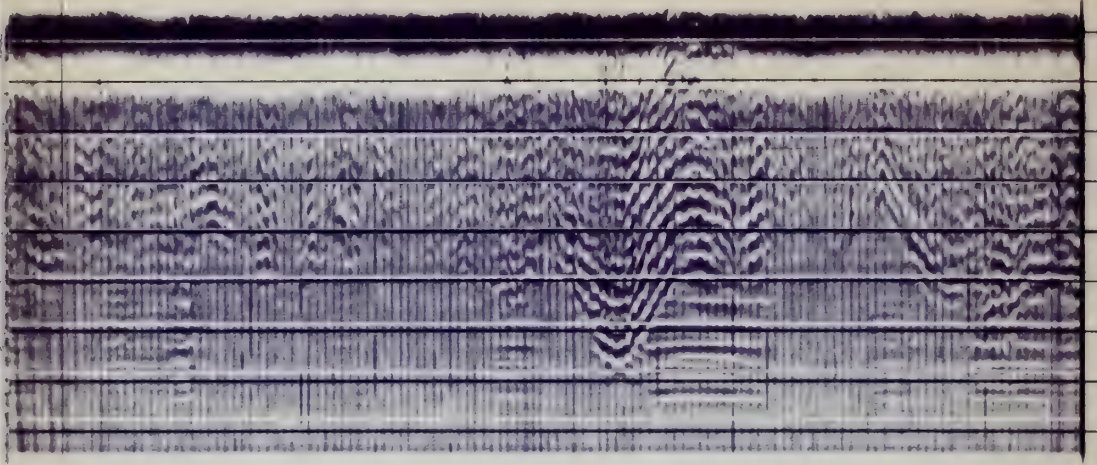
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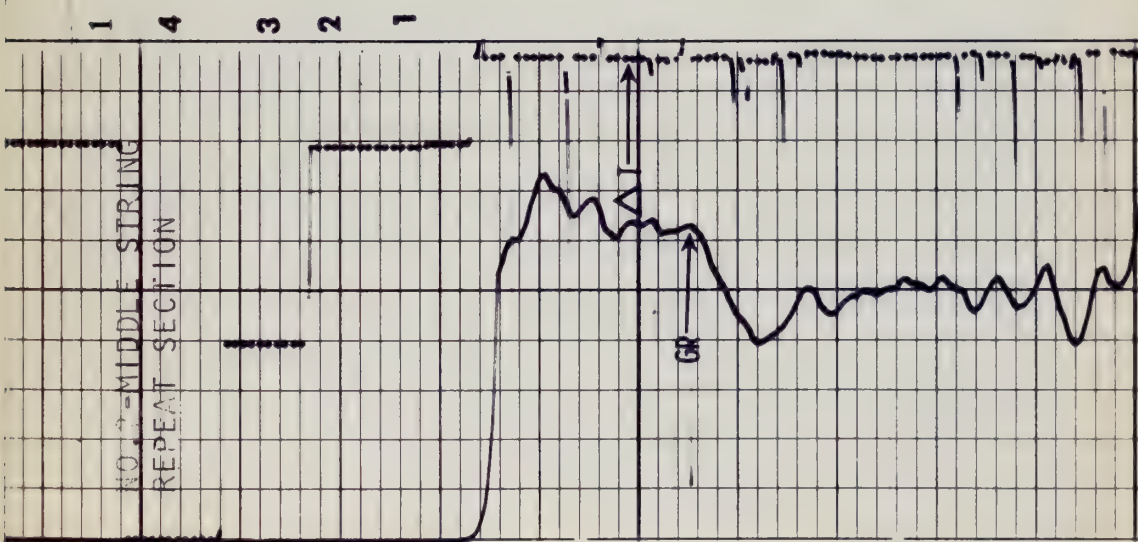
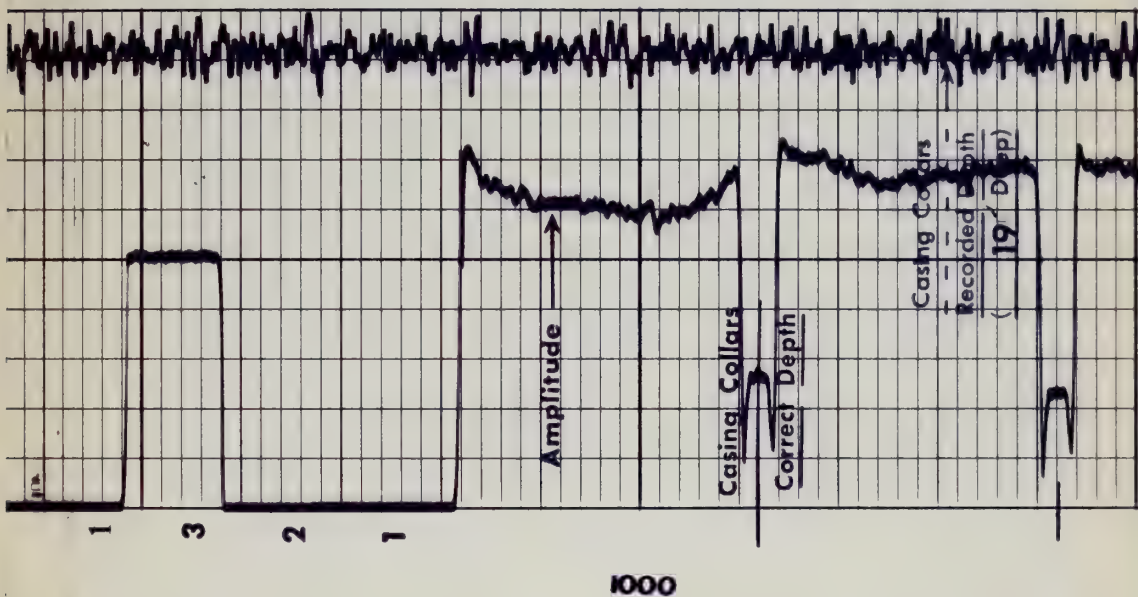
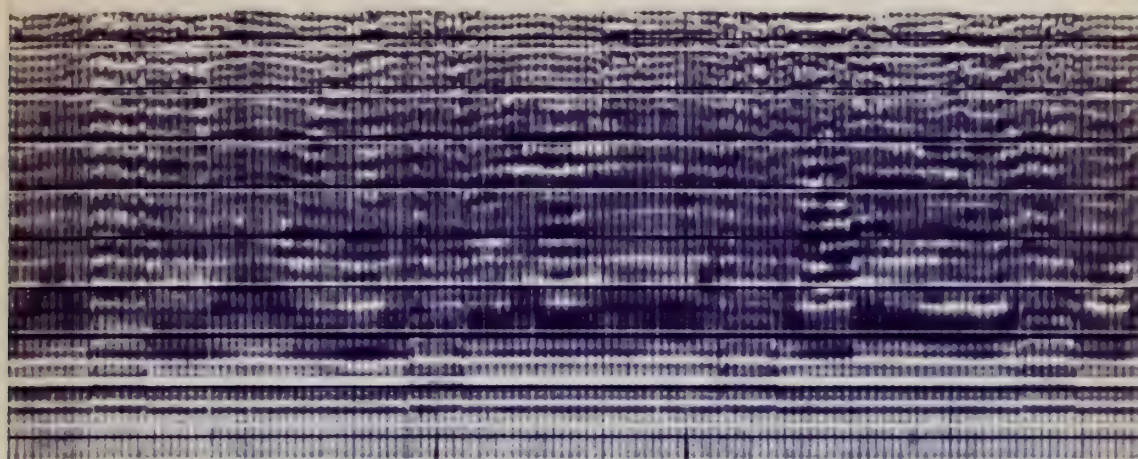
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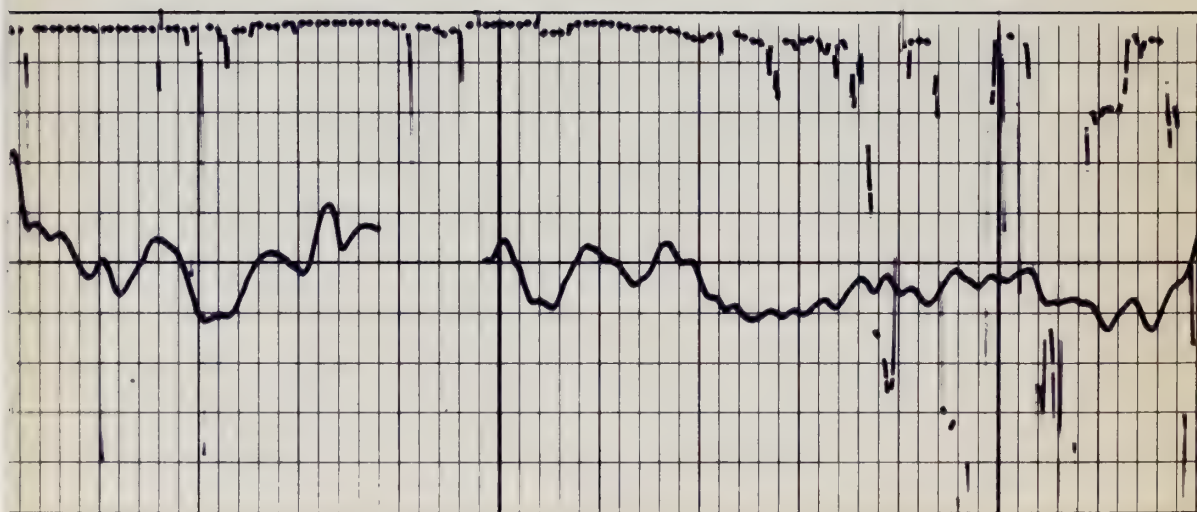
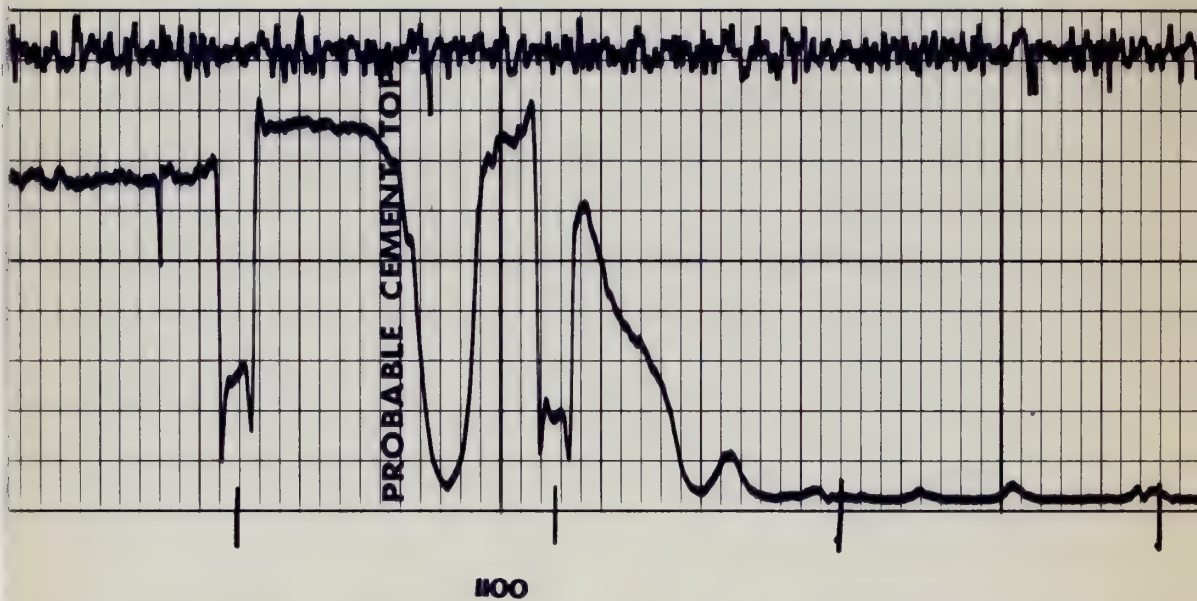
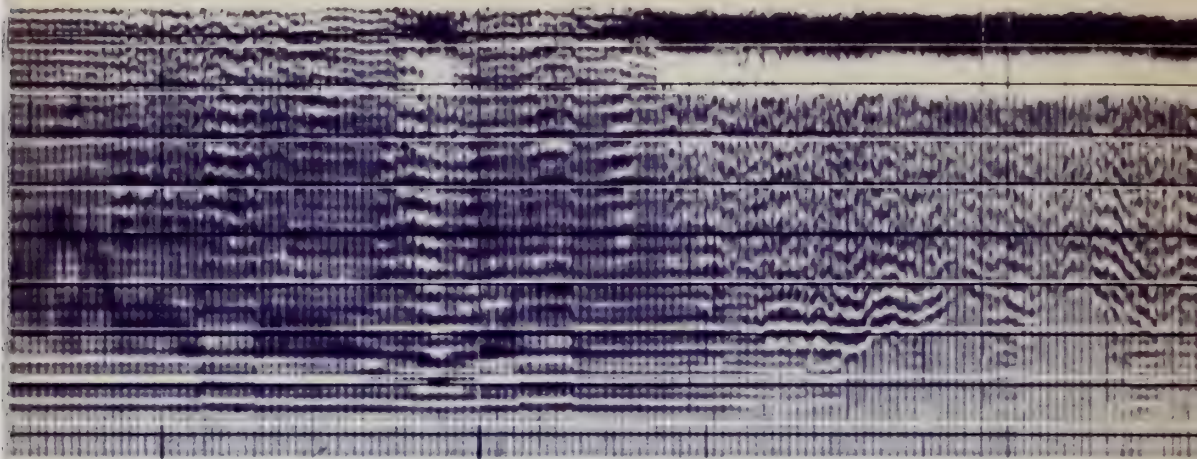


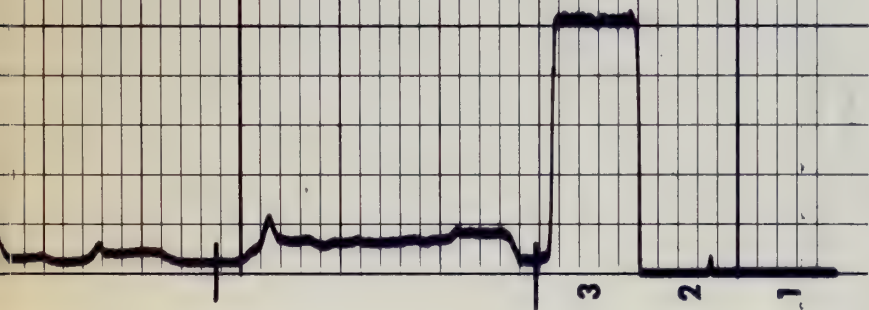
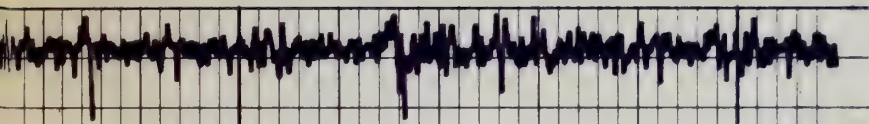
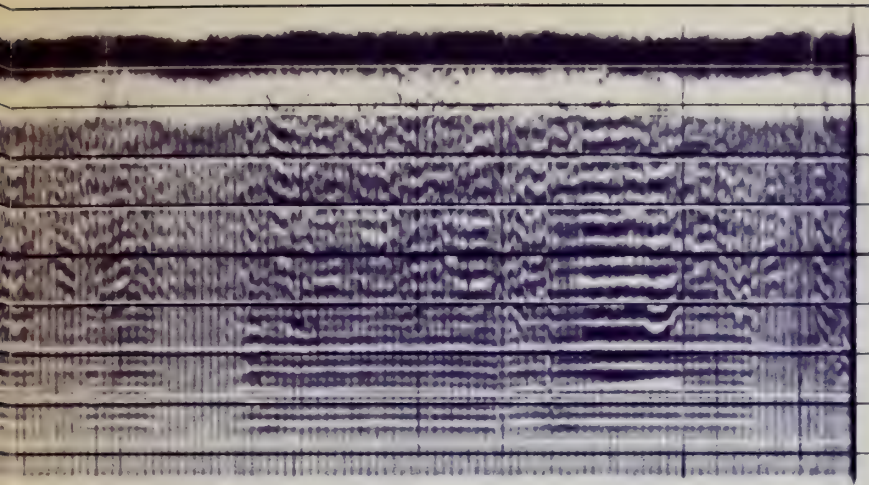
INDICATED INTERVAL
PERFORATED ONE SECT
PER FOOT WITH
1 11/16 IN PERFORE



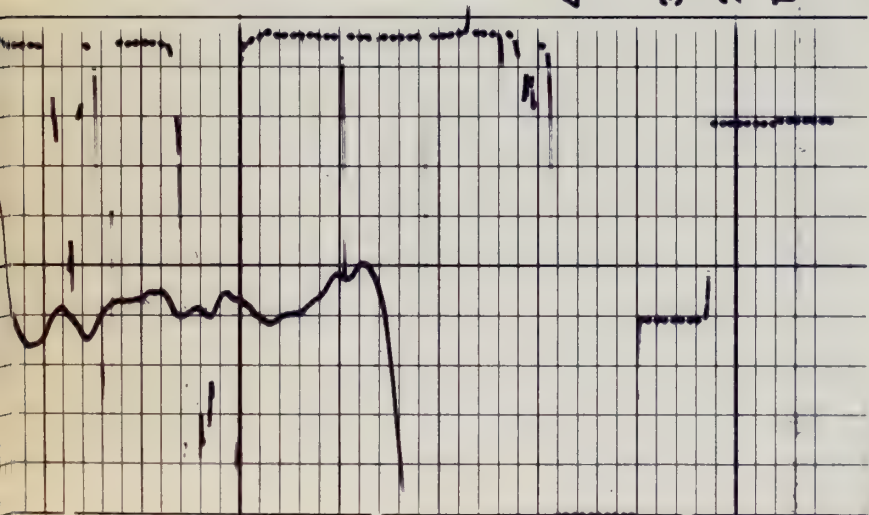






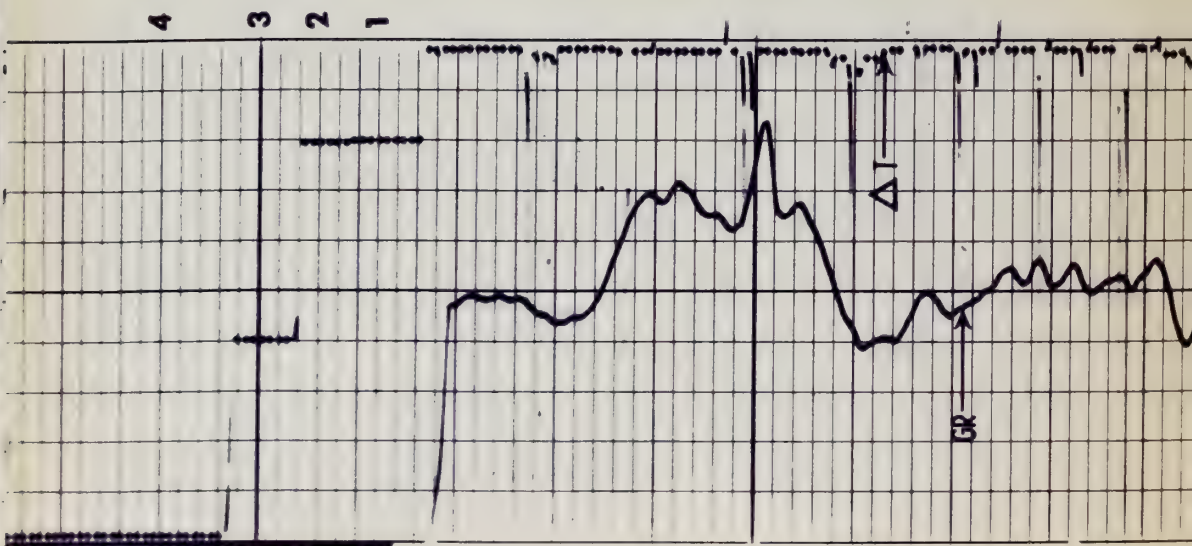
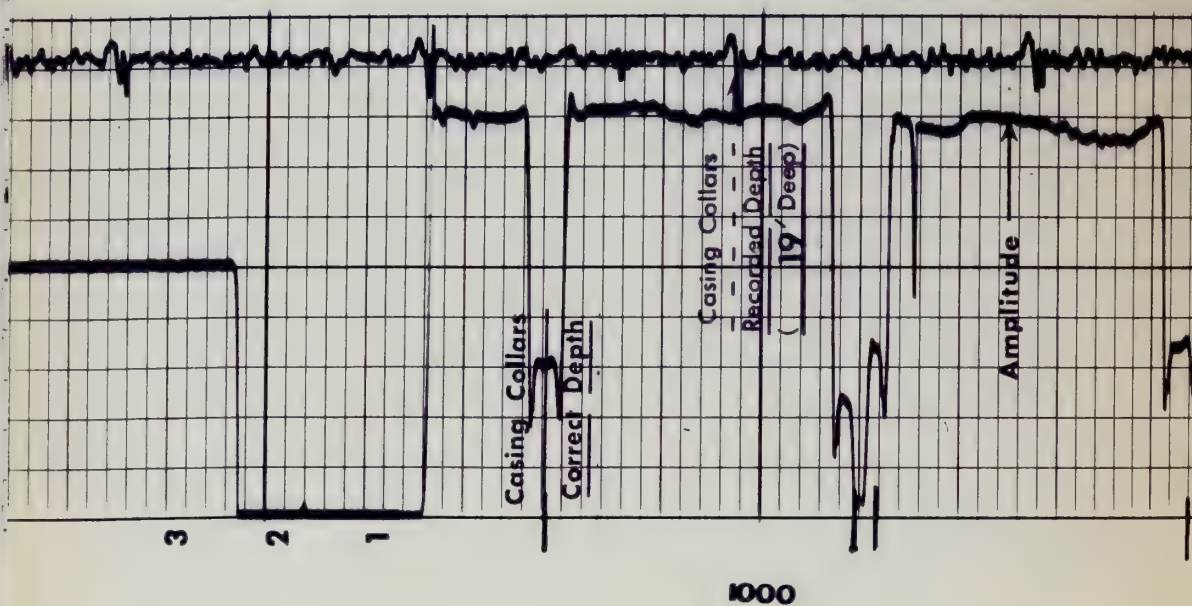
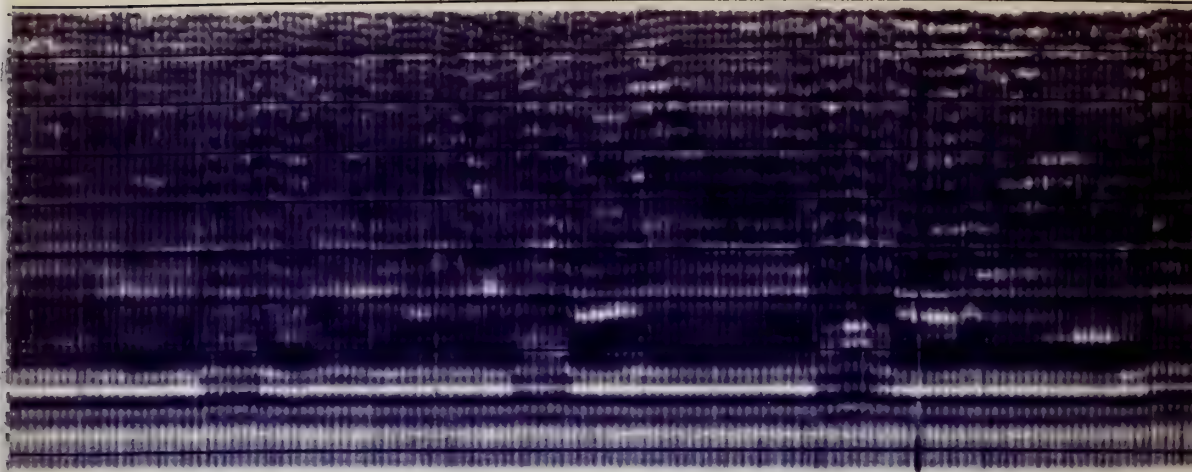


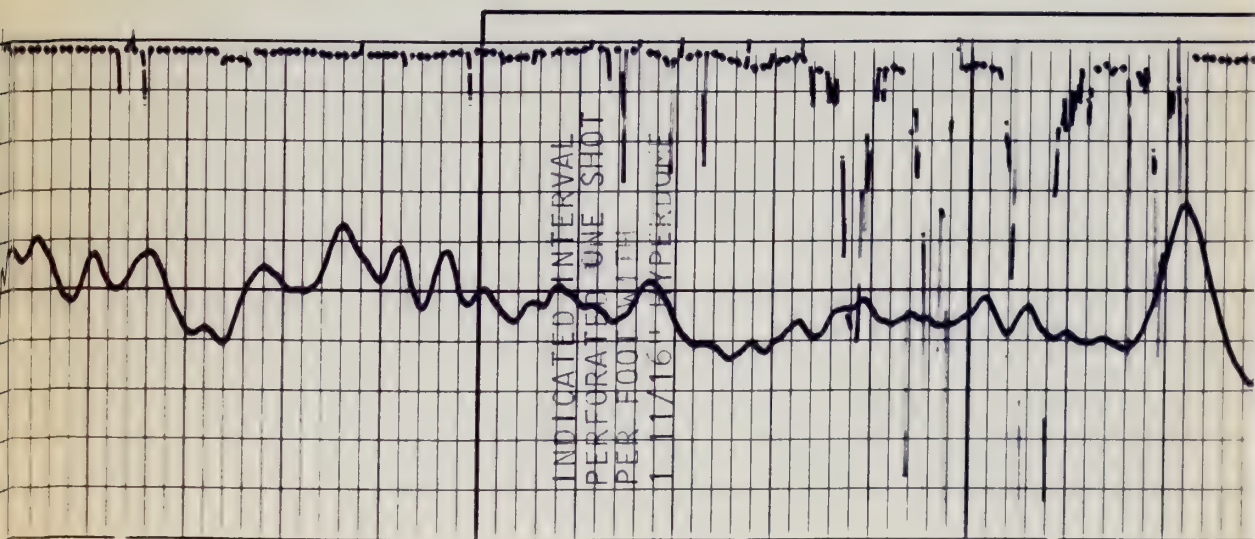
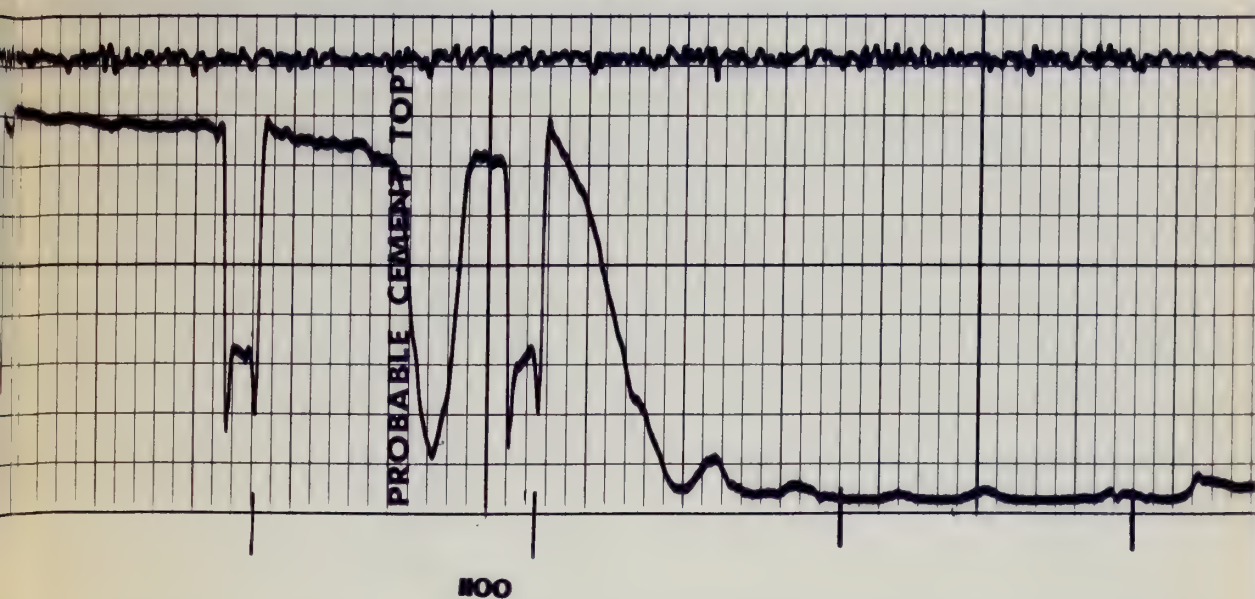
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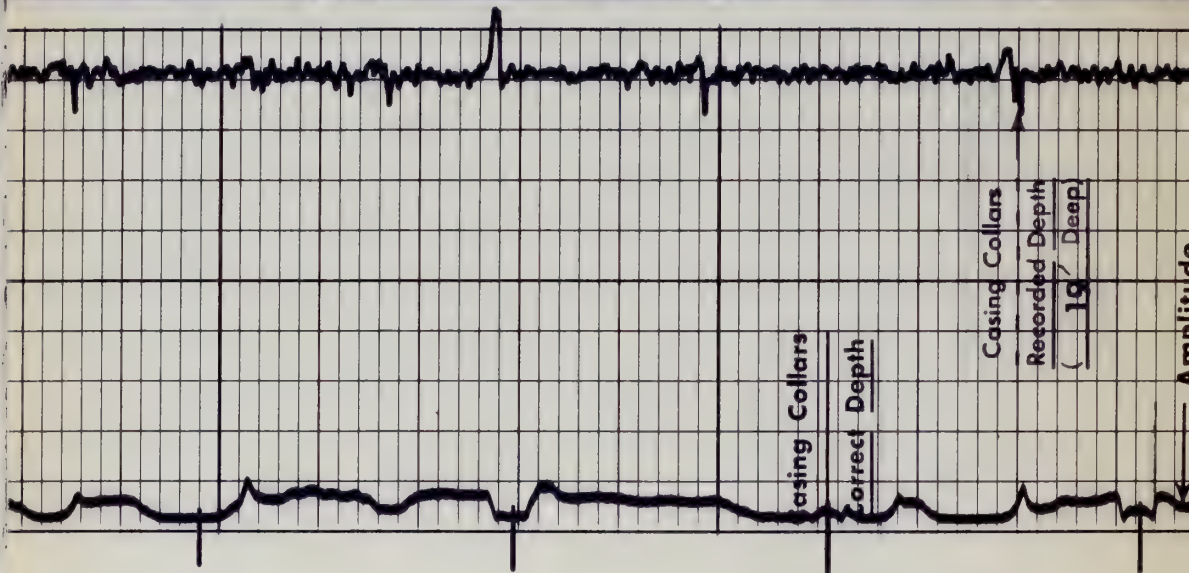
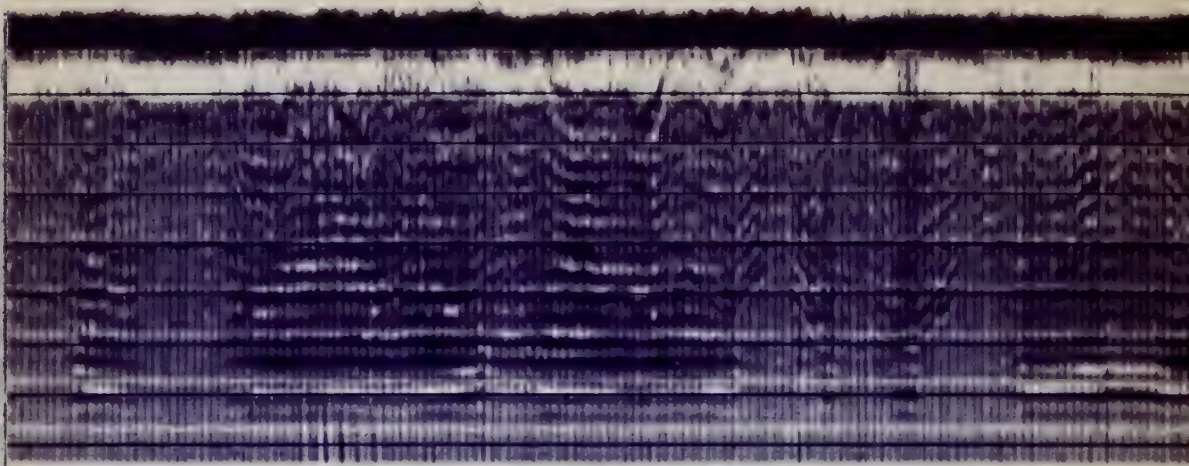


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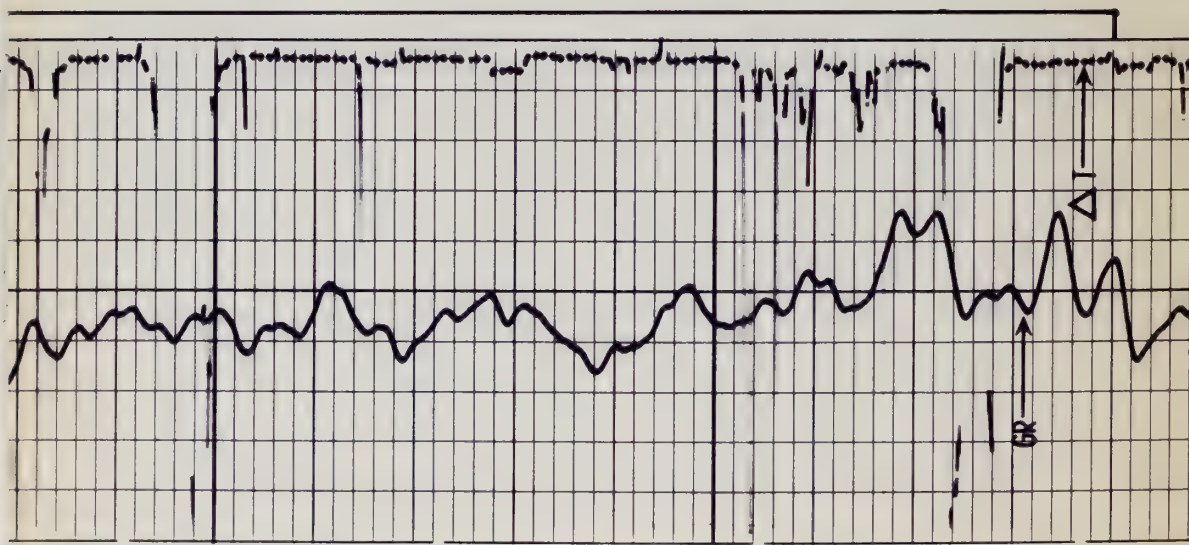
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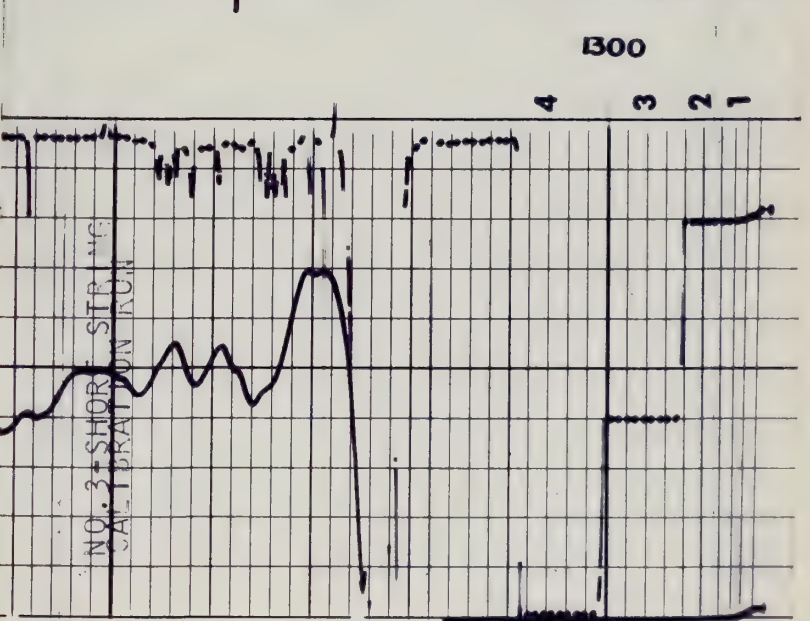
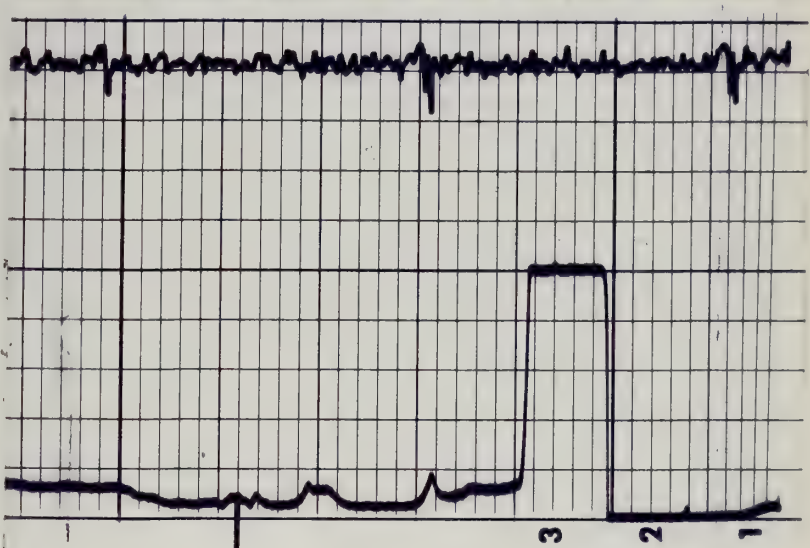
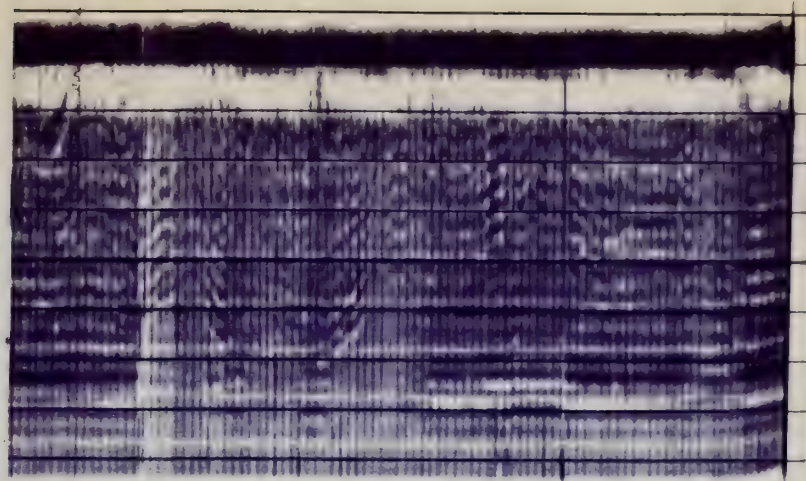
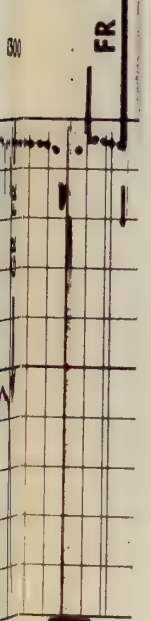
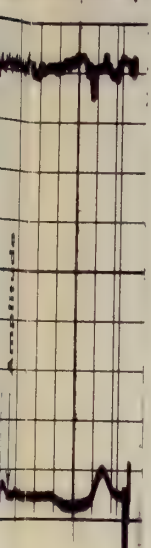


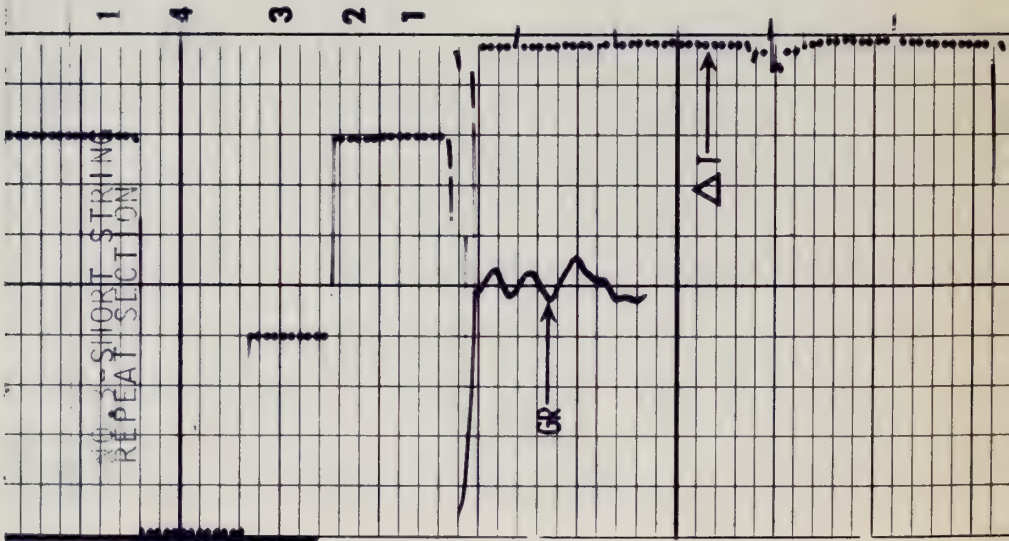
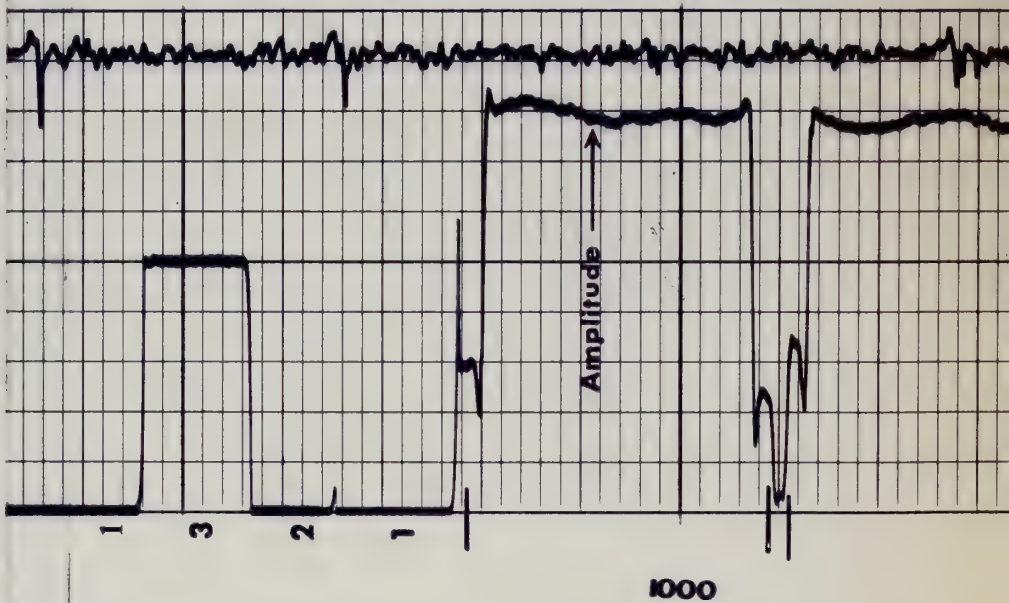
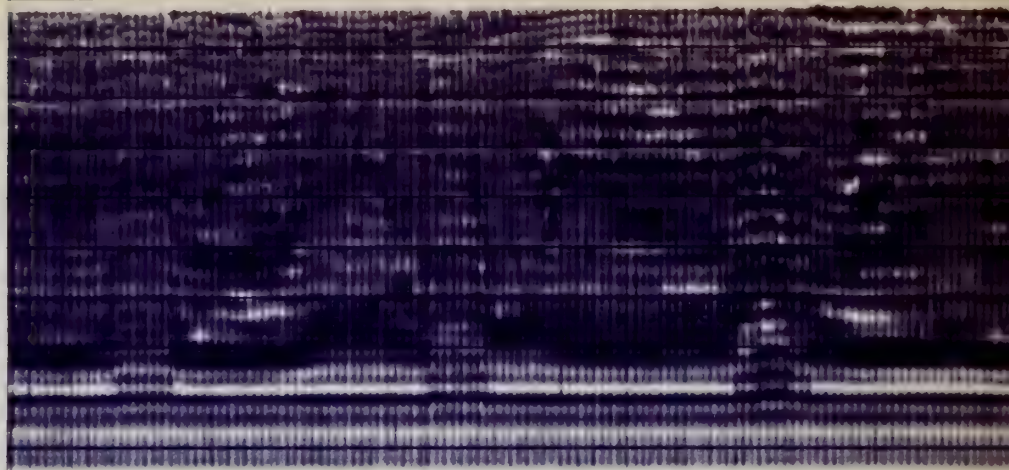


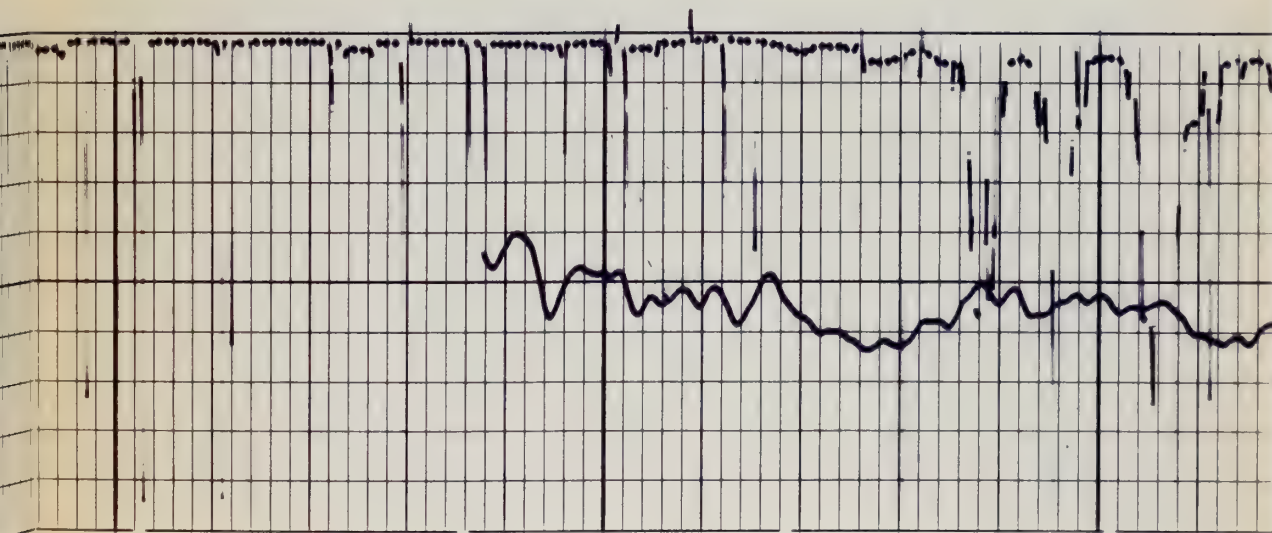
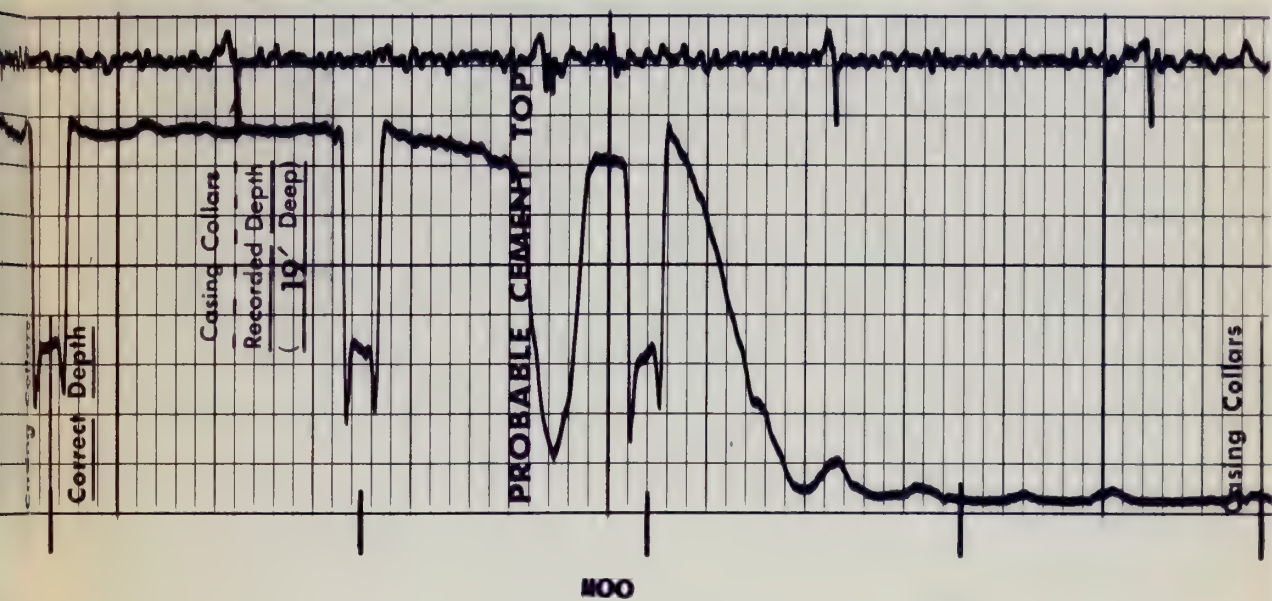
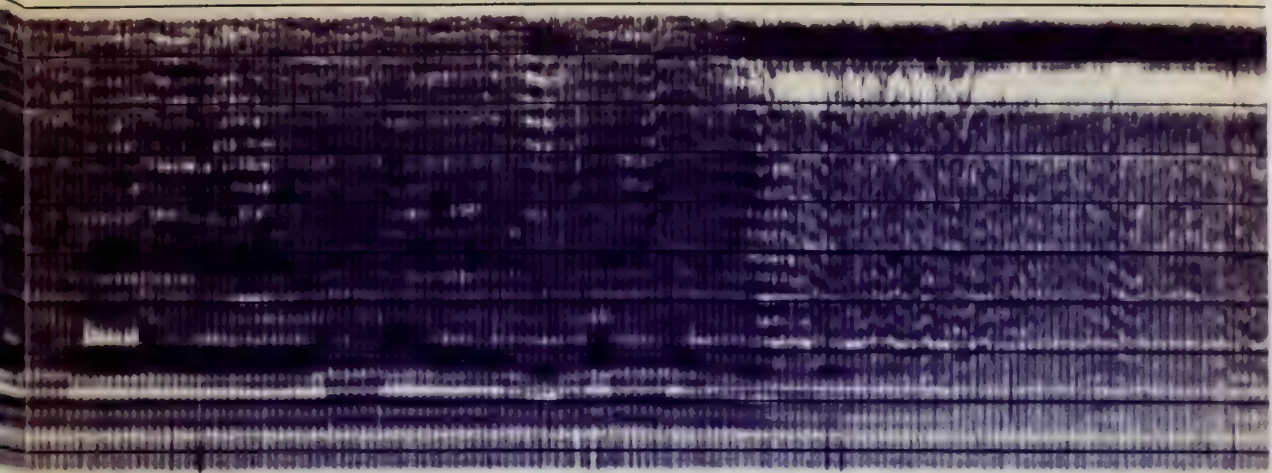


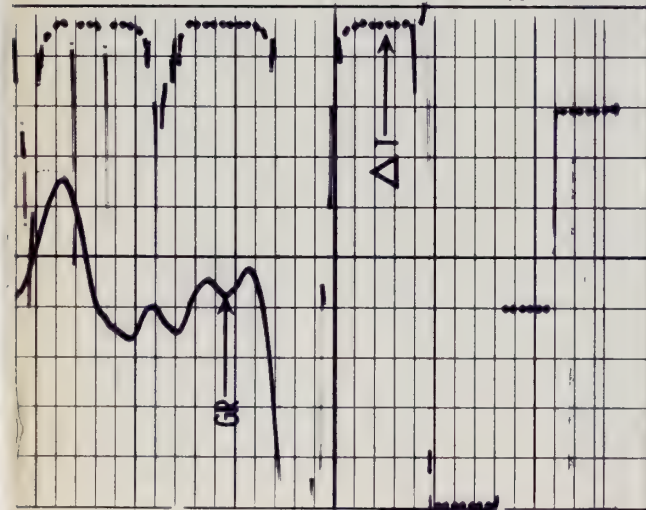
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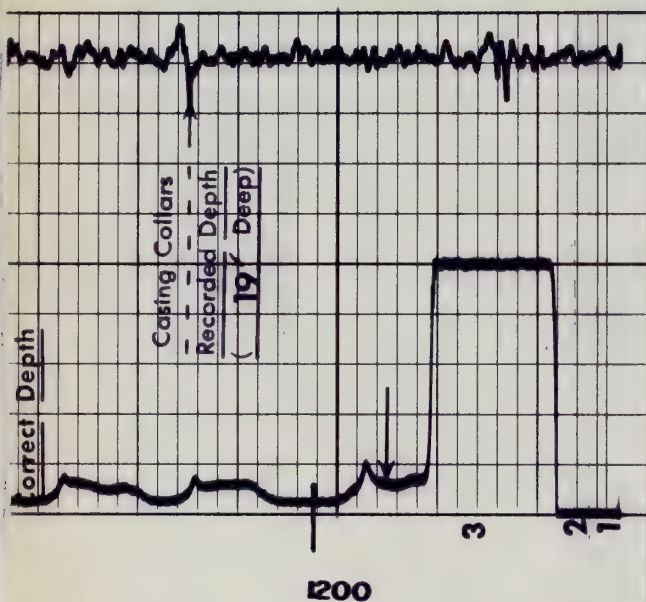


TRANSIT TIME

MICROSECONDS _____ SPACING 200

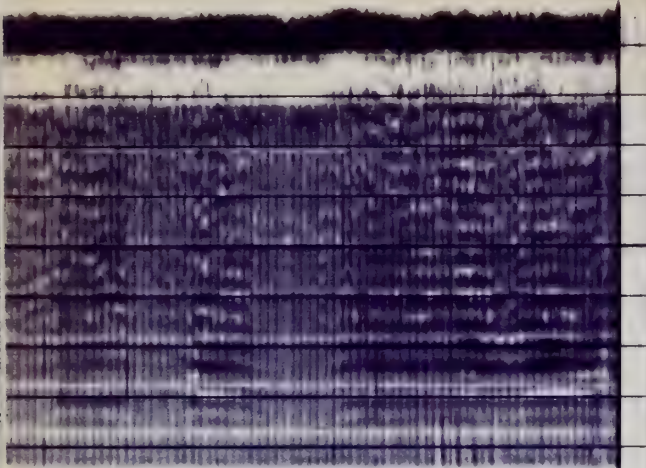
GAMMA RAY

API UNITS



CASING BOND

MILLIVOLTS _____



VARIABLE DENSITY

MICROSECONDS _____ 5 FT. SPACING

HERE

DEPTH

COMPANY
WELL

ATLANTIC REFINED OIL COMPANY
NO. 11

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

DATE 12-1-54

Elev:

KB
DF
GL 6900

CEMENT BOND CALIBRATION CODING

Δt		AMPLITUDE
1.	MECHANICAL ZERO	MECHANICAL ZERO
2.	240 μ sec	ELECTRICAL ZERO
3.	320 μ sec	CALIBRATE
4.	400 μ sec	



BLANCO
BLQ
COUNTY

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Pip
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Bi
77

Schlumberger**ORIENTED PERFORATING RECORD
AND CASING COLLAR LOG**

COUNTY RIO BLANCO
FIELD or
LOCATION SORGHUM GULCH
WELL S.G. NO. 11
COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANYWELL S.G. NO. 11FIELD SORGHUM GULCHCOUNTY RIO BLANCO STATE COLORADO

Location:

12' NSL &
160' WELSec. 7 Twp. 3S Rge. 96W

Other Services:

CBL-GR-
VDL-CCL

Permanent Datum: GROUND LEVEL; Elev.: 6900
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6900

Date	9/25/74
Run No.	ONE
Pipe String No.	1-2-3
Pipe String Ident.	LONG-MIDDLE-SHORT
Type Orienting	POWERED
Type fluid in hole	WATER
Salinity, PPM Cl.	----
Density	----
Level	FULL
Max rec. temp., deg F.	----
Operating rig time	
Recorded by	ST. AUBYN
Witnessed by	MR. ELLARD

BORE-HOLE RECORD

CEMENTING RECORD

Bit	From	To	Type	Wgt.	From	To
7 7/8	60	2819	Primary			
			Squeeze			

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

EQUIPMENT DATA				DEPTHS RELATE TO		CASING COLLARS	
Hoist Truck No.	3862	Rotator Size	1 11/16	Radioactivity Measurements <input checked="" type="checkbox"/>			
Inst. Truck No.	3862	Rotator No.		Schlumberger Line Measurements <input type="checkbox"/>			
Tool Serial No.		Indexer Type					
Location	VERNAL	Indexer No.					

PERFORATING DATA			LOGGING DATA			PIPE STRING RECORD							
Depths	No. Shots	Gun Size	Gun Type	Time Const.	Sens. Setting	Zero Shift	Calib. Sens.	Calib. Defl.	Number	1	2	3	4
From	To								Identific't'n	LONG	MIDDLE	SHORT	
									Size	2 3/8	2 3/8	2 3/8	
									Weight	4.7	4.7	4.7	
									Depth	2820	1511	1323	

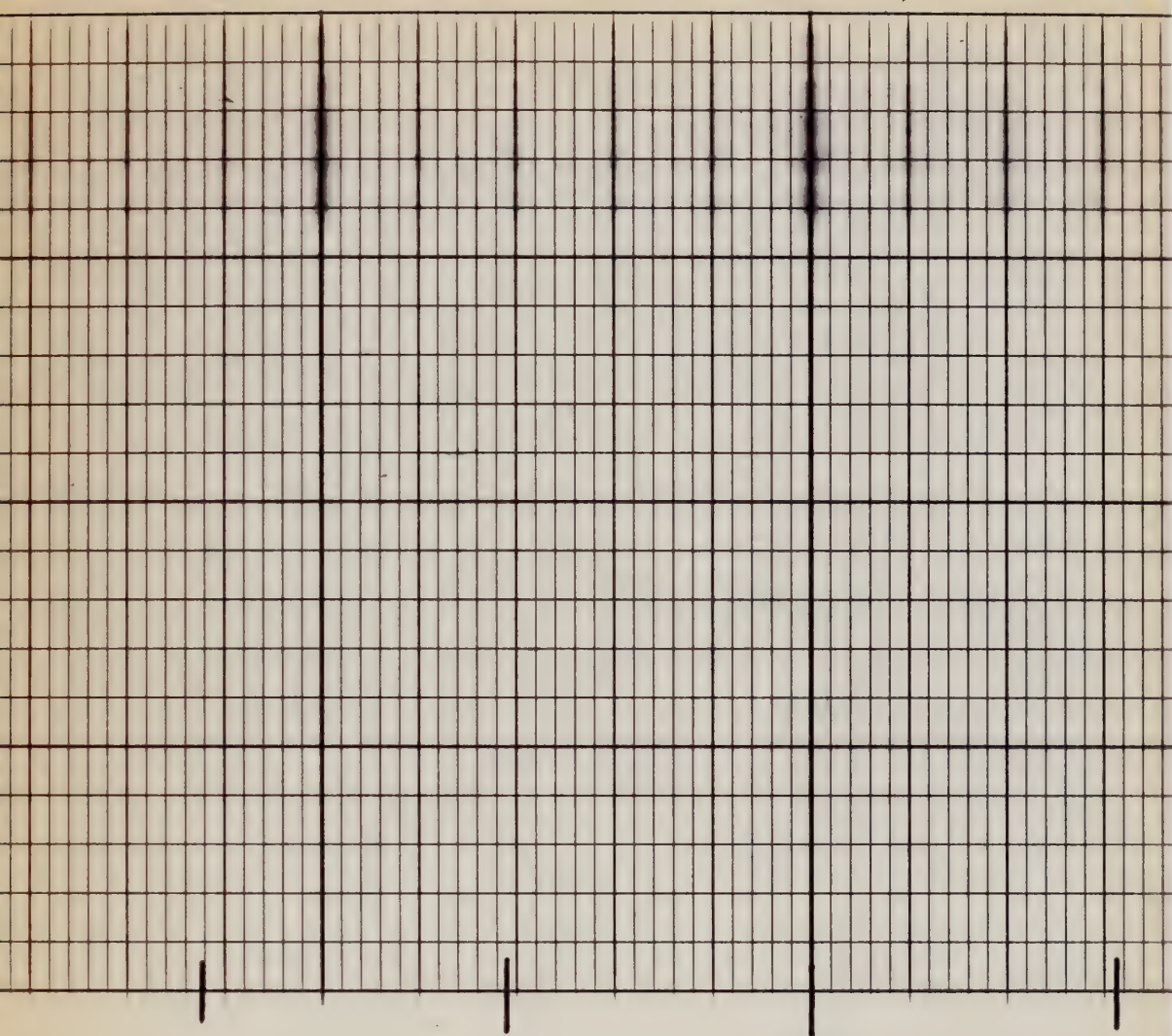
Remarks:

CASING COLLAR LOG
BEFORE PERFORATION

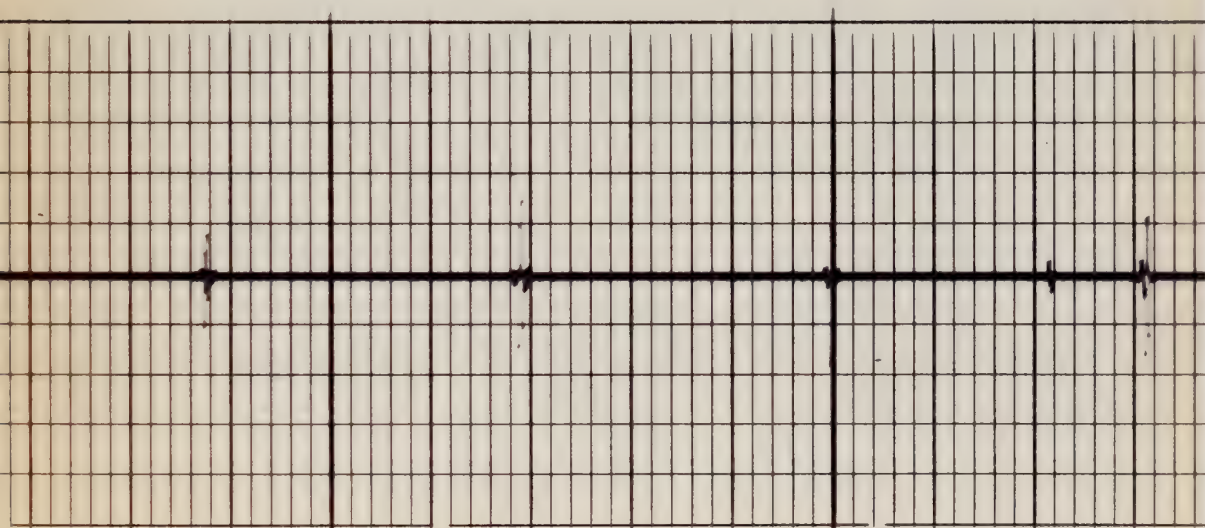
DEPTHS

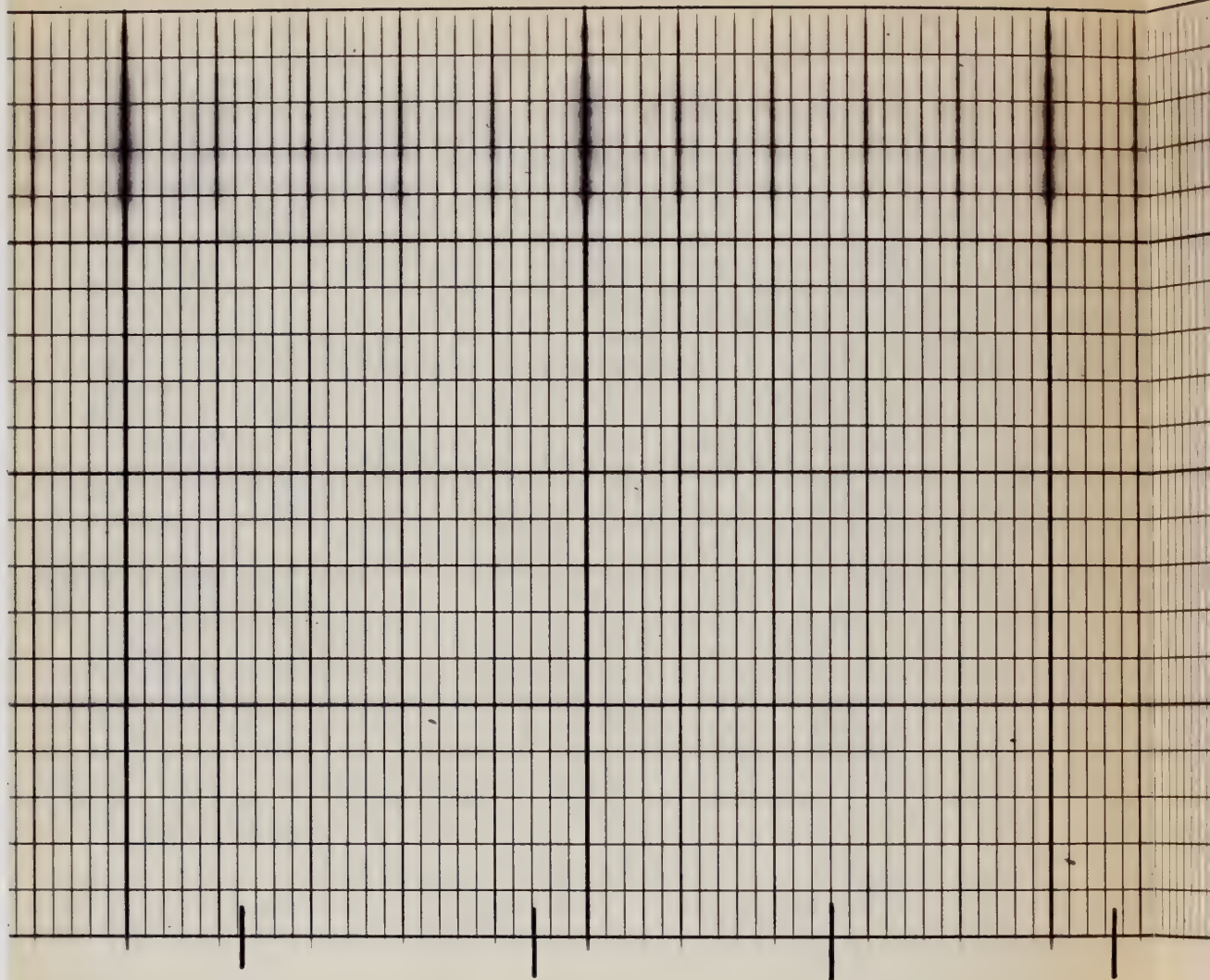
0900

NO. 1 - LONG STRING

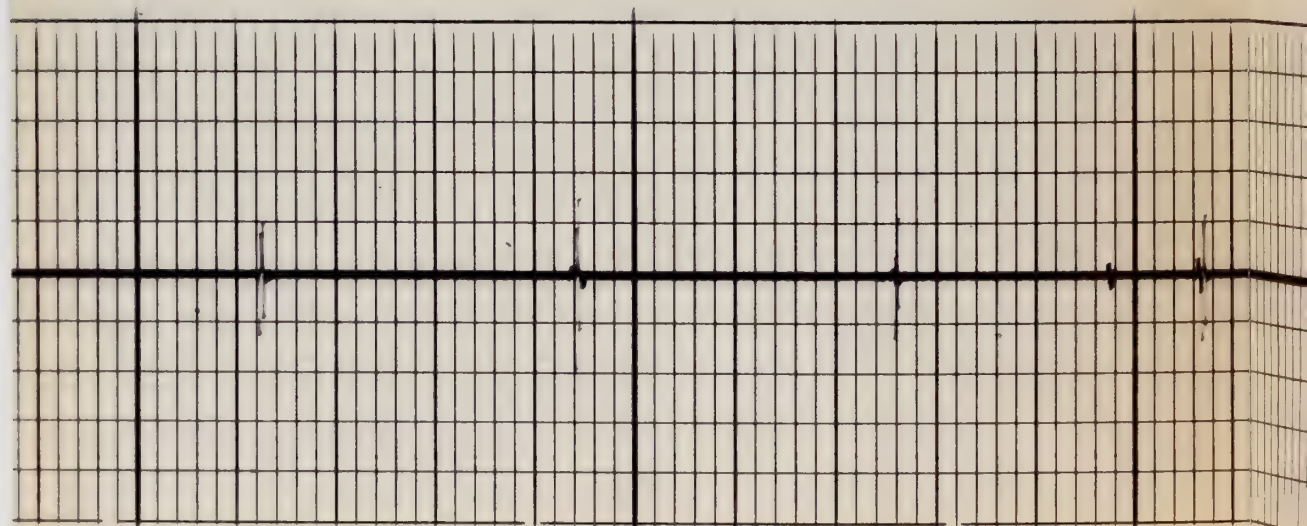


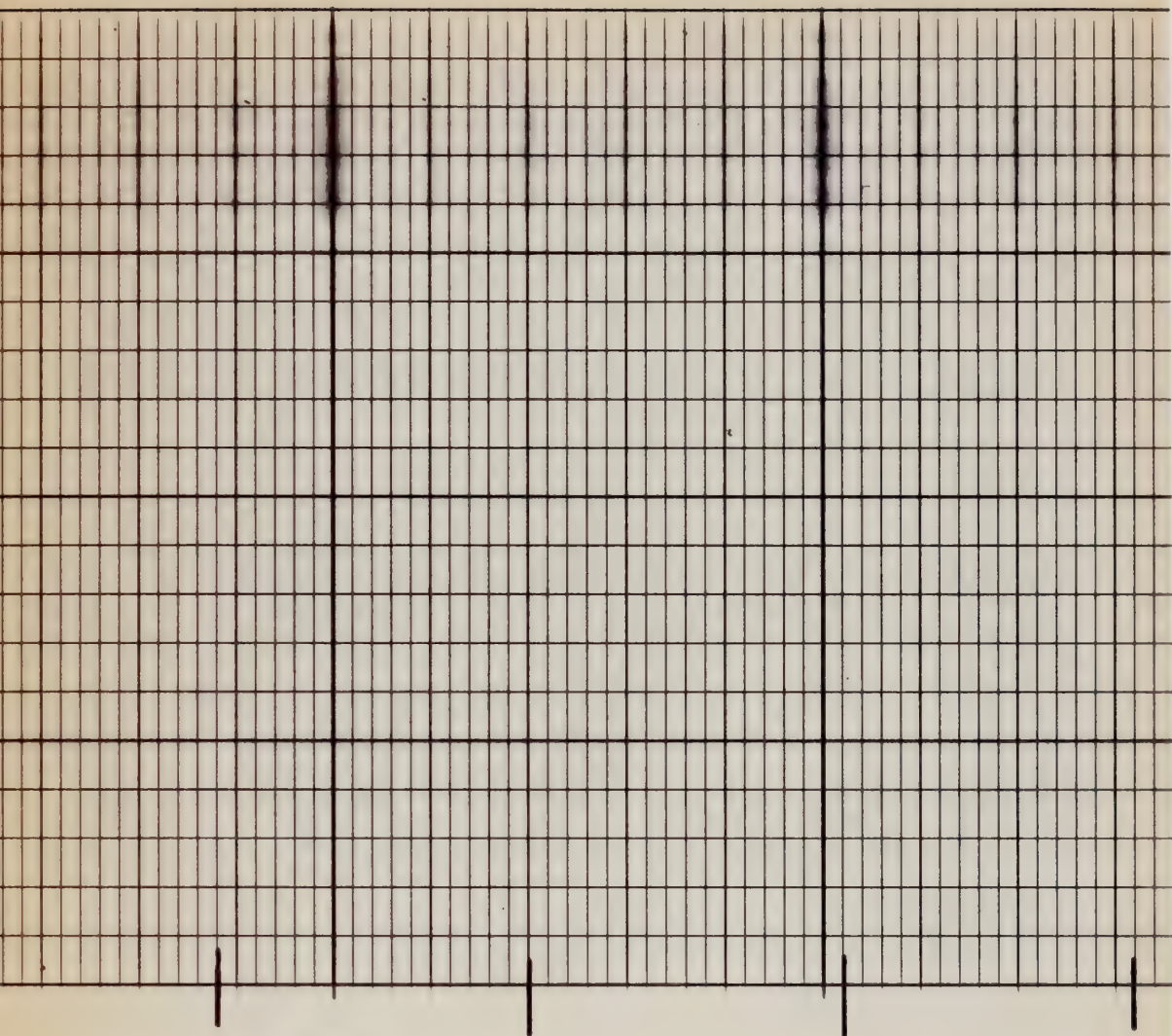
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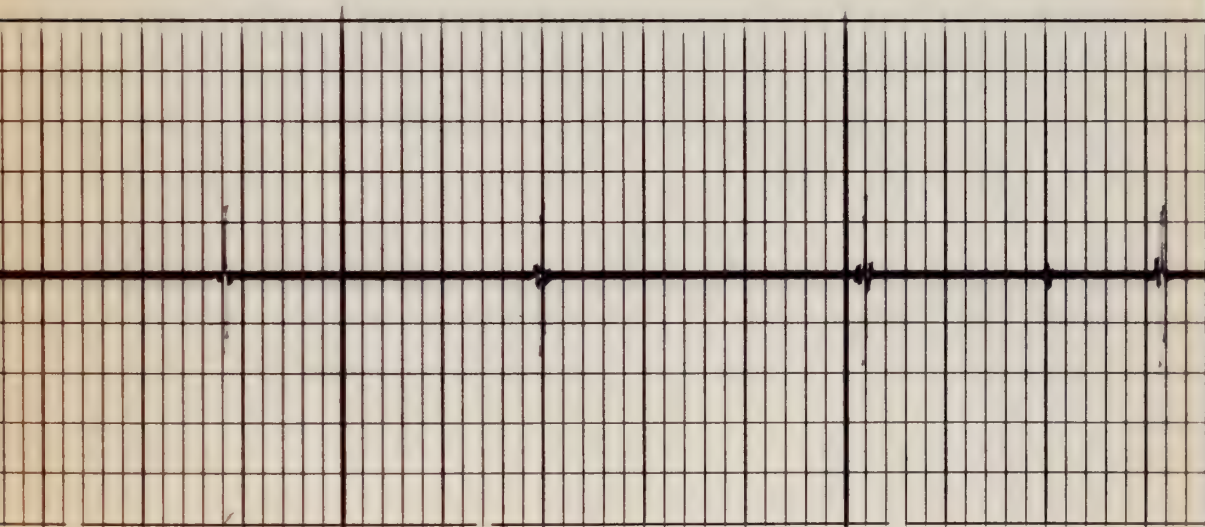


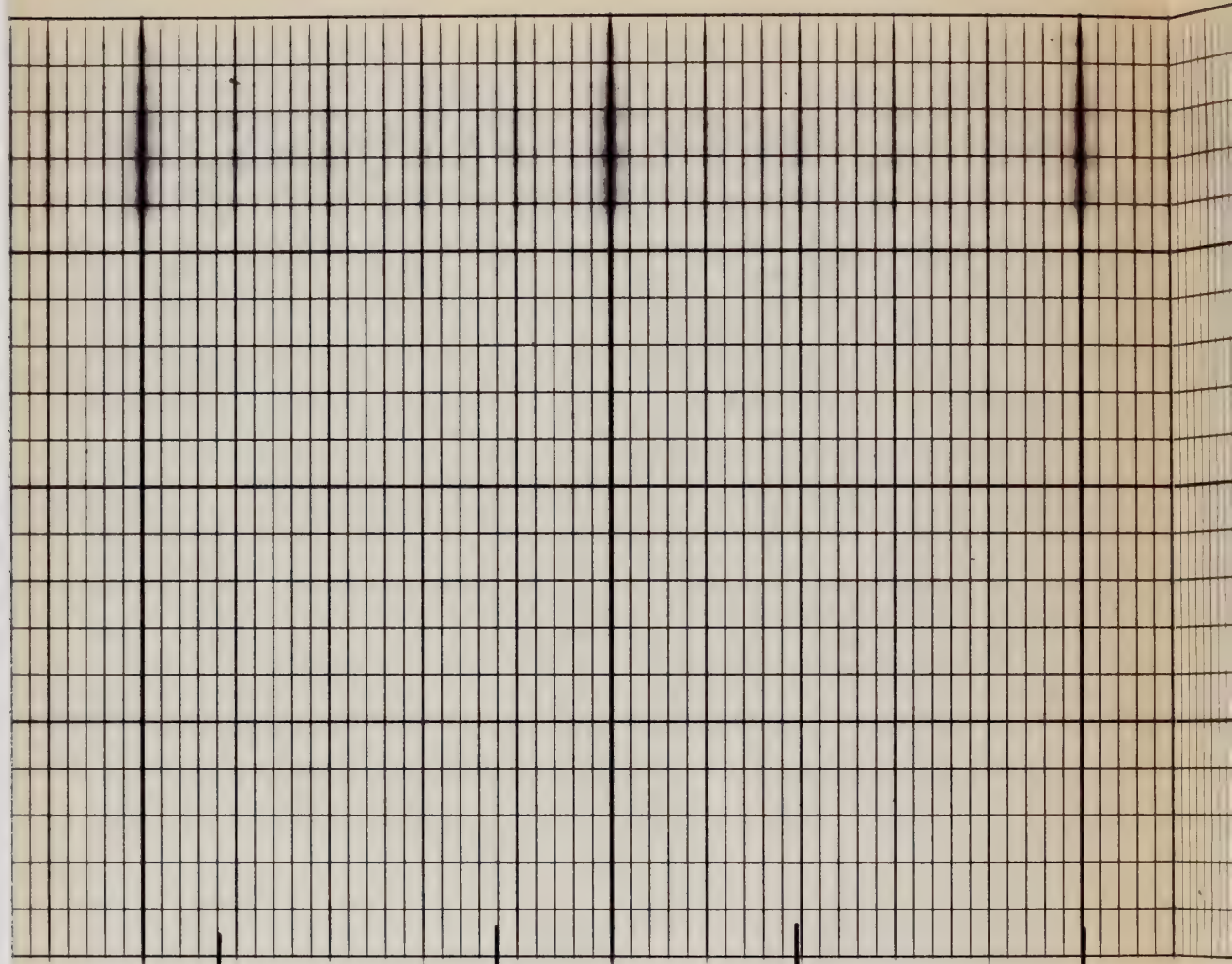
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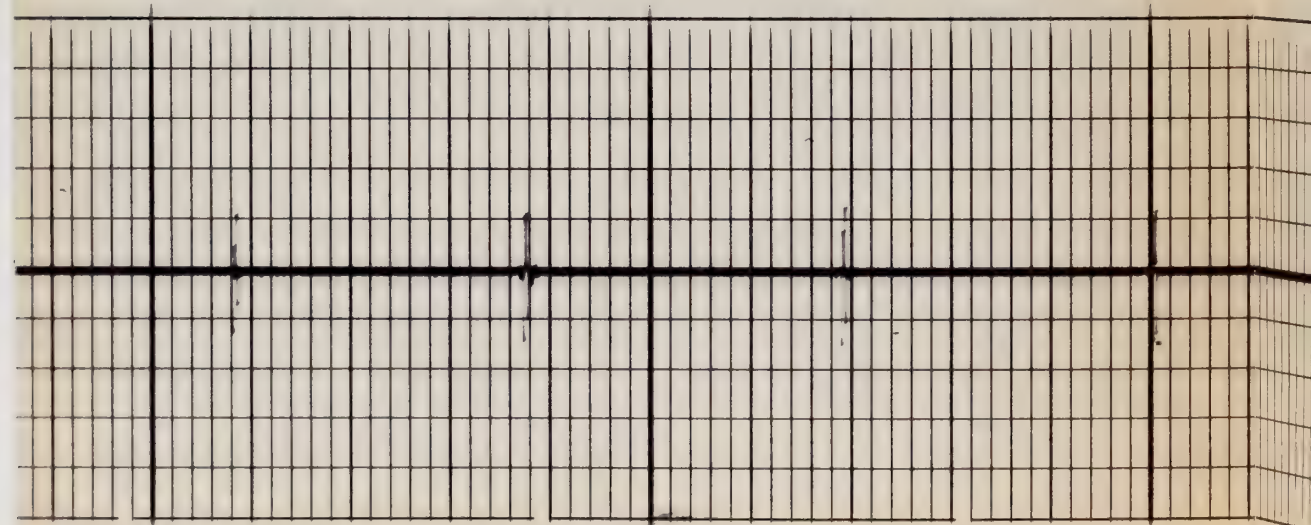
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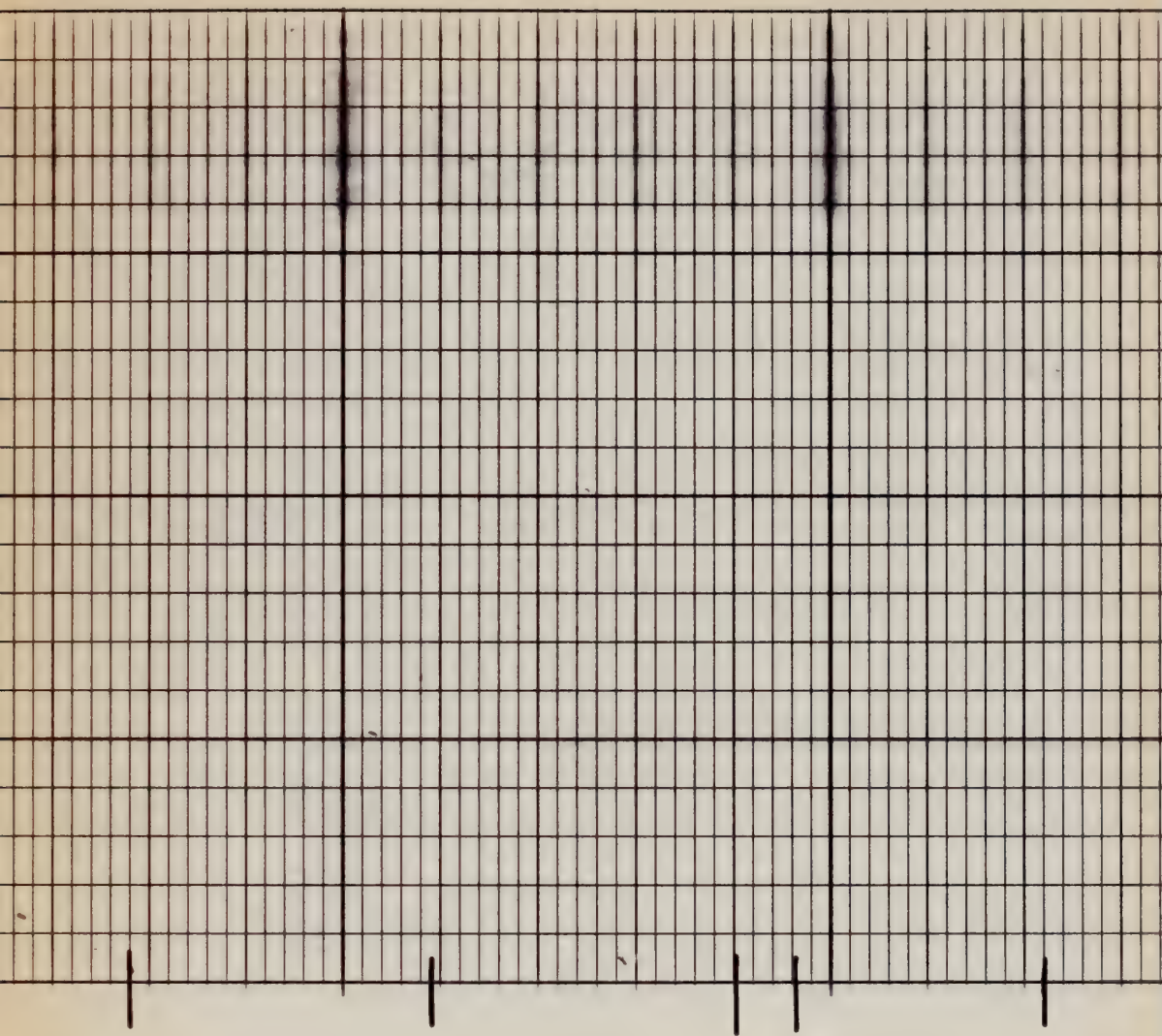




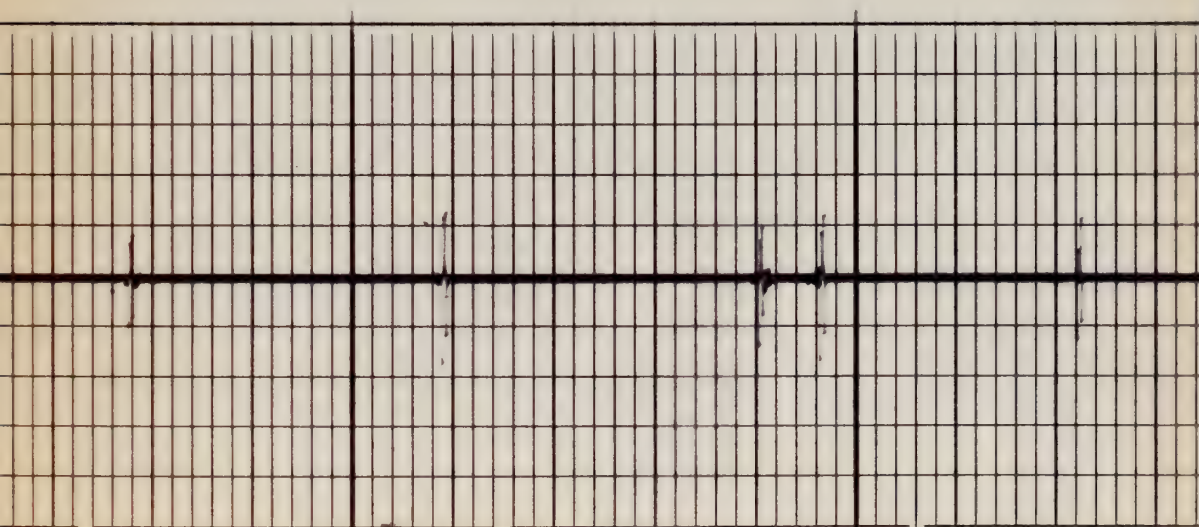
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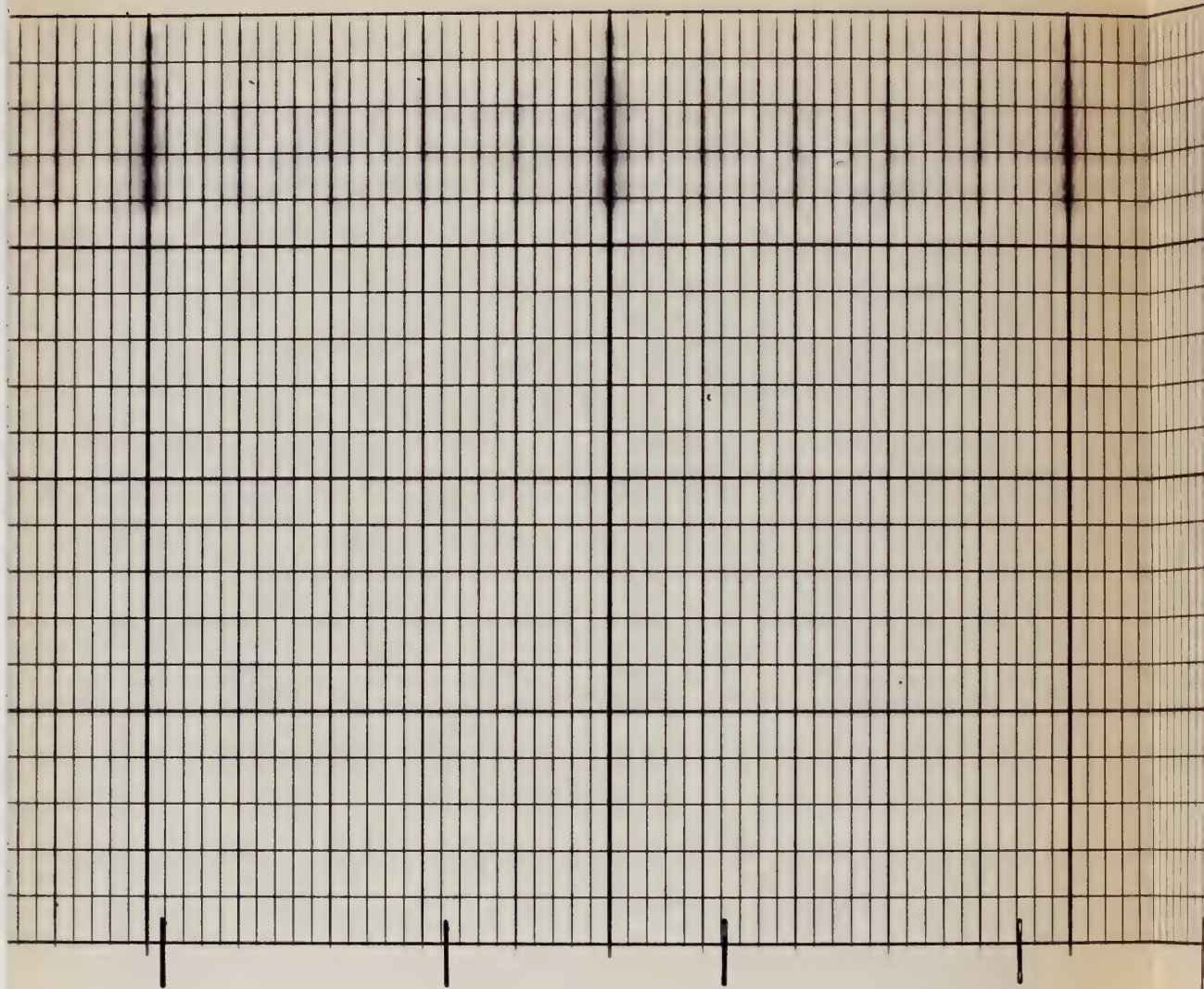
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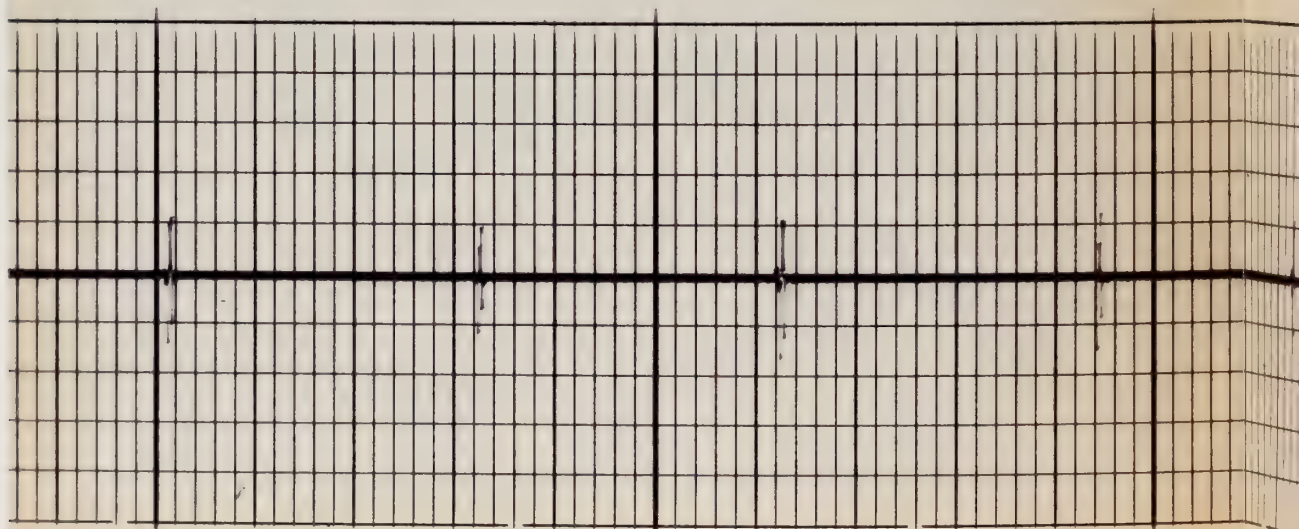


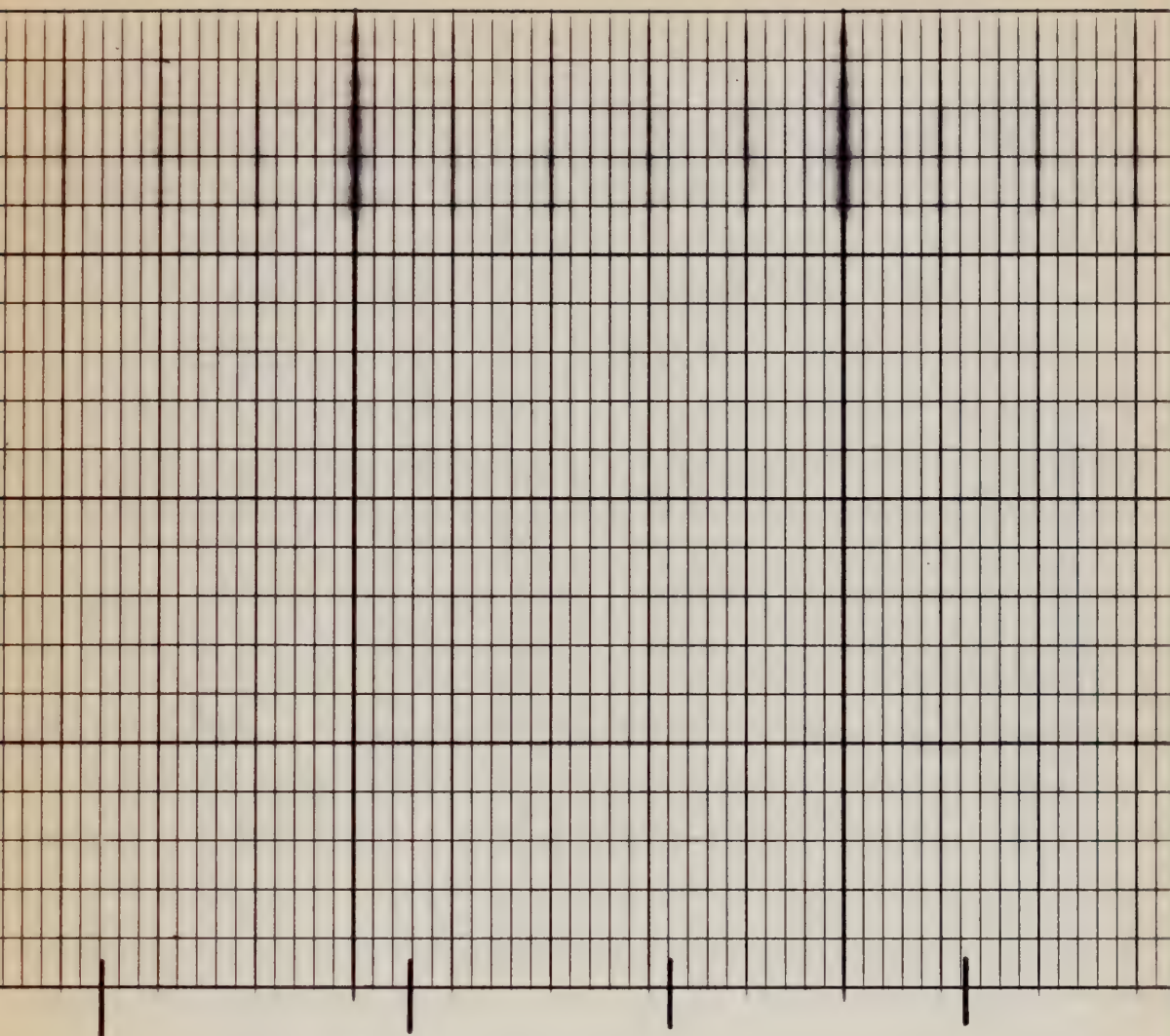
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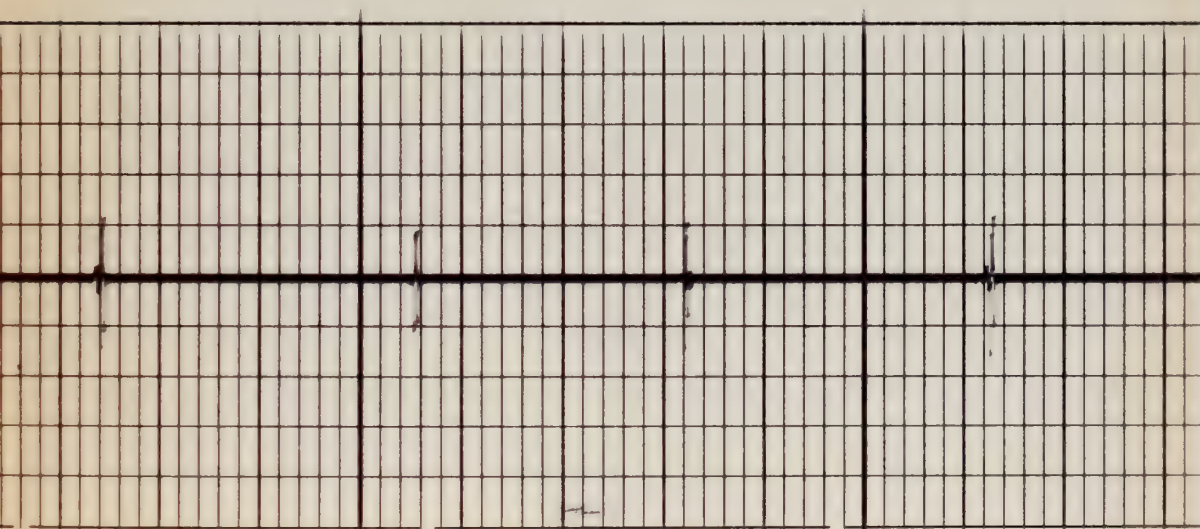


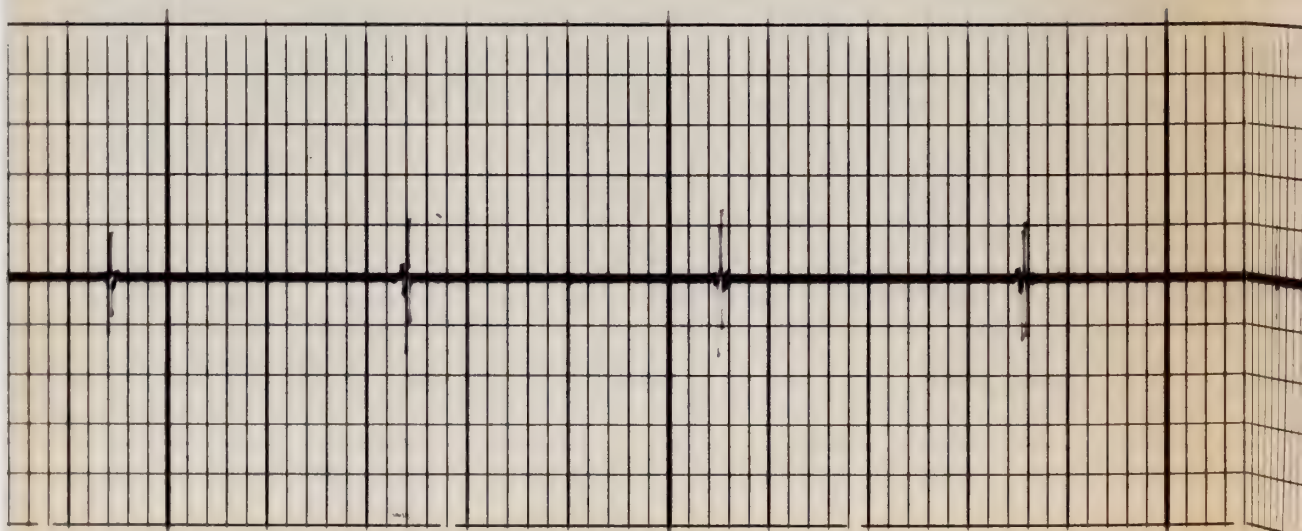
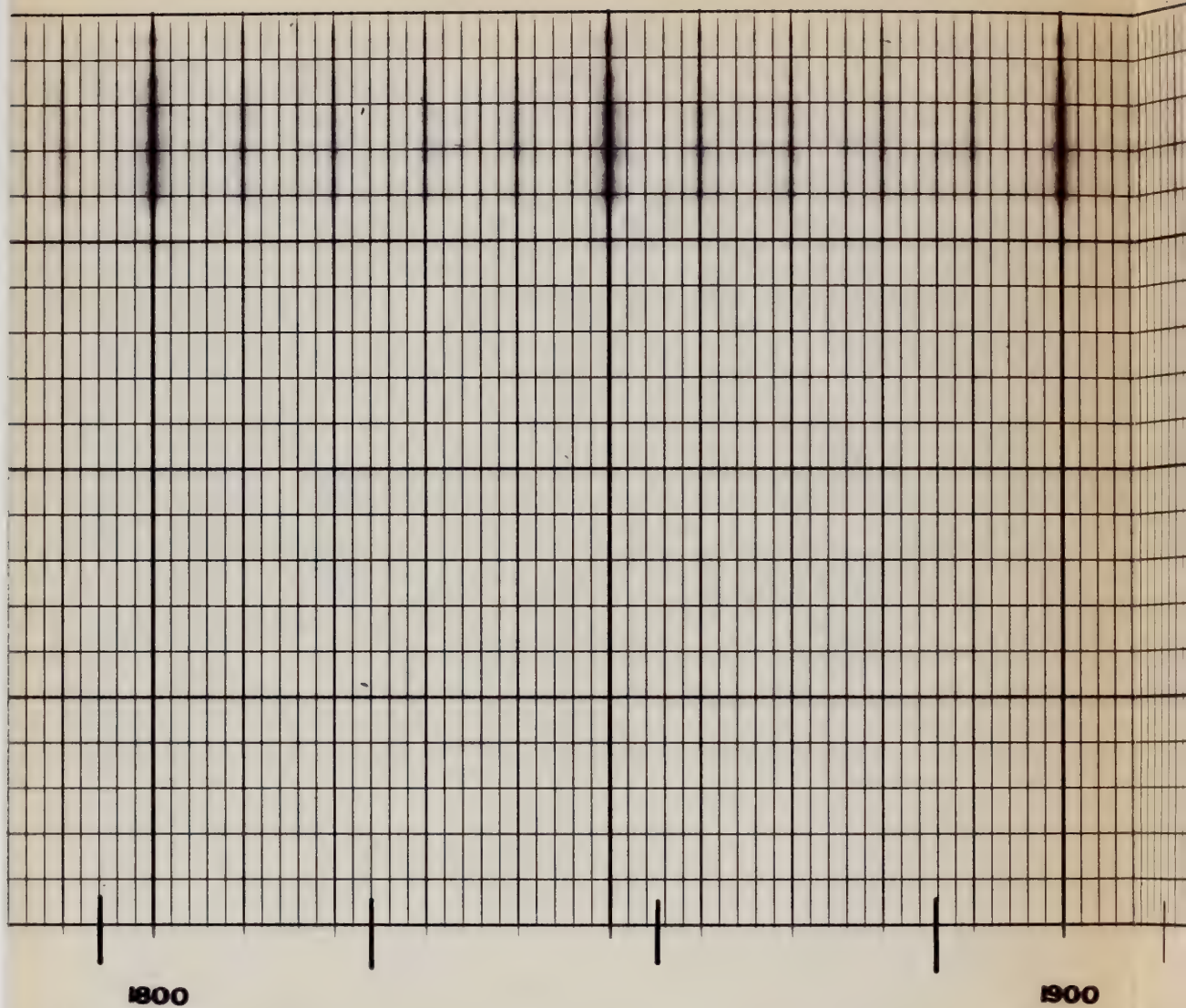
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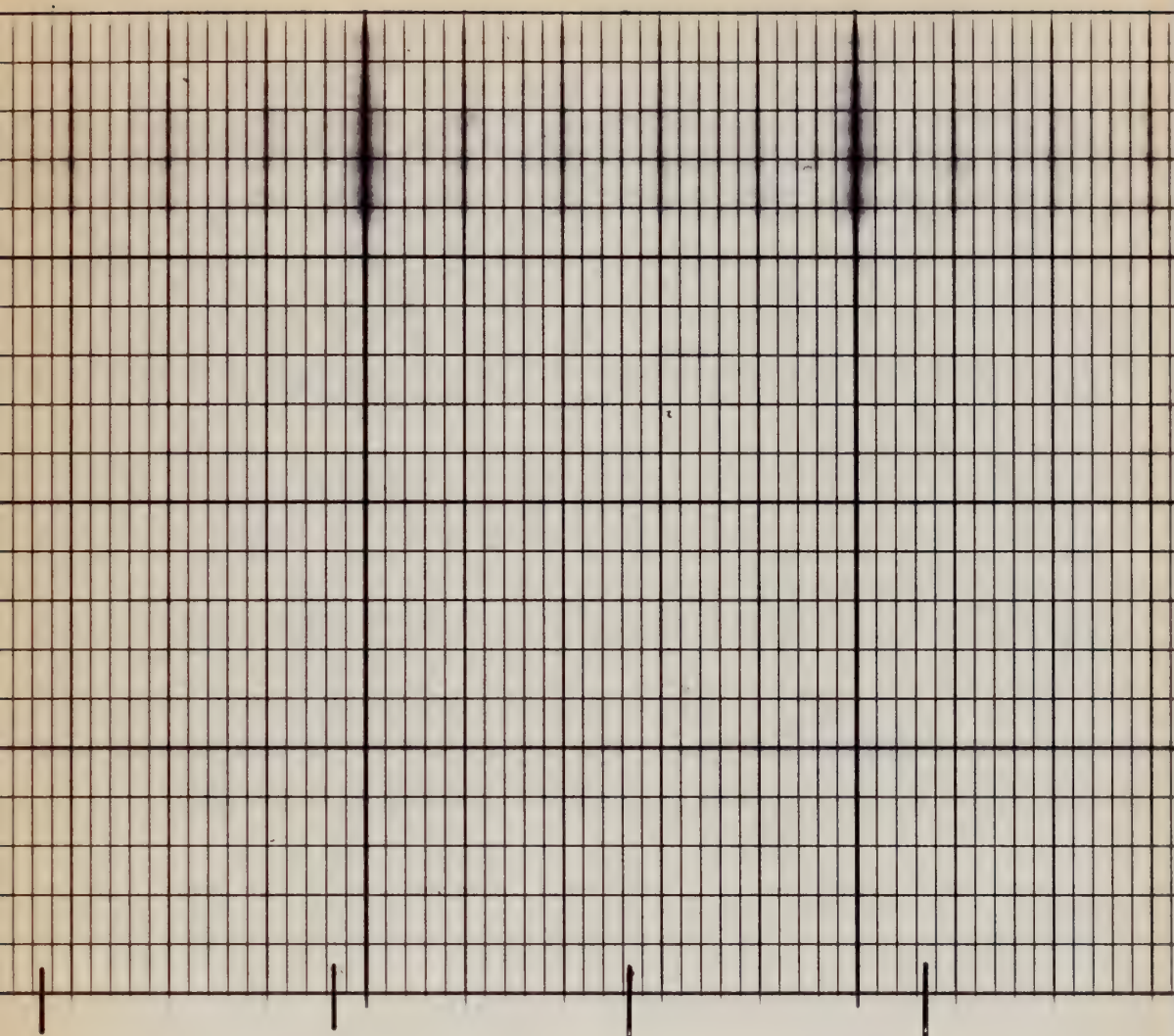




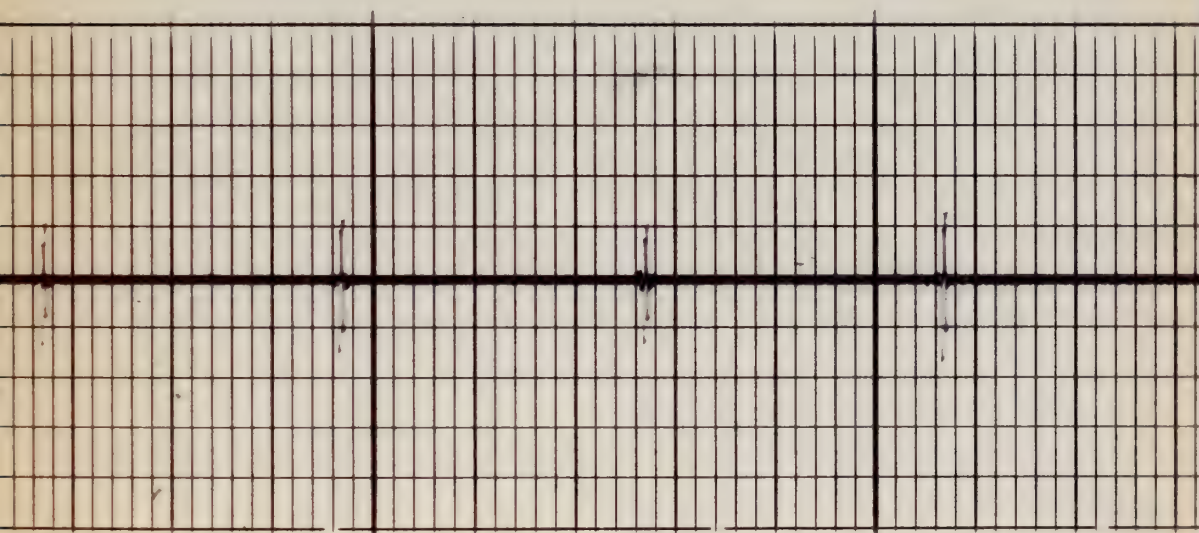
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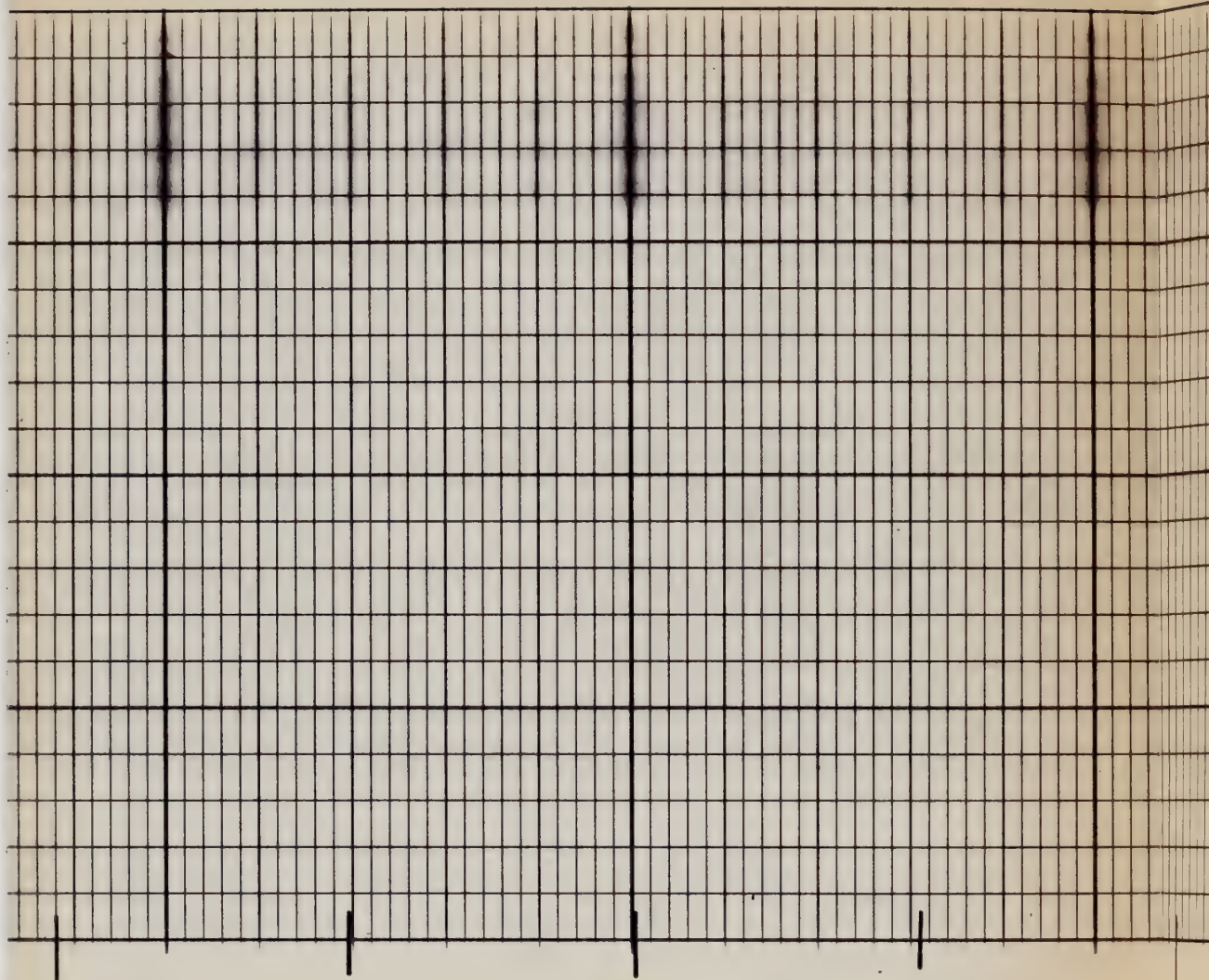




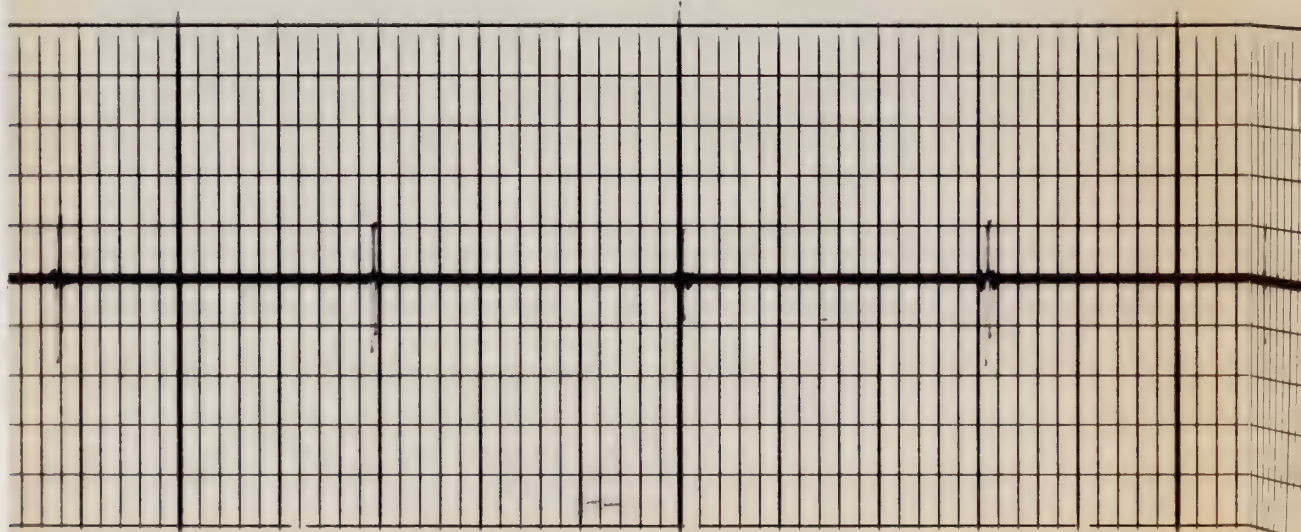


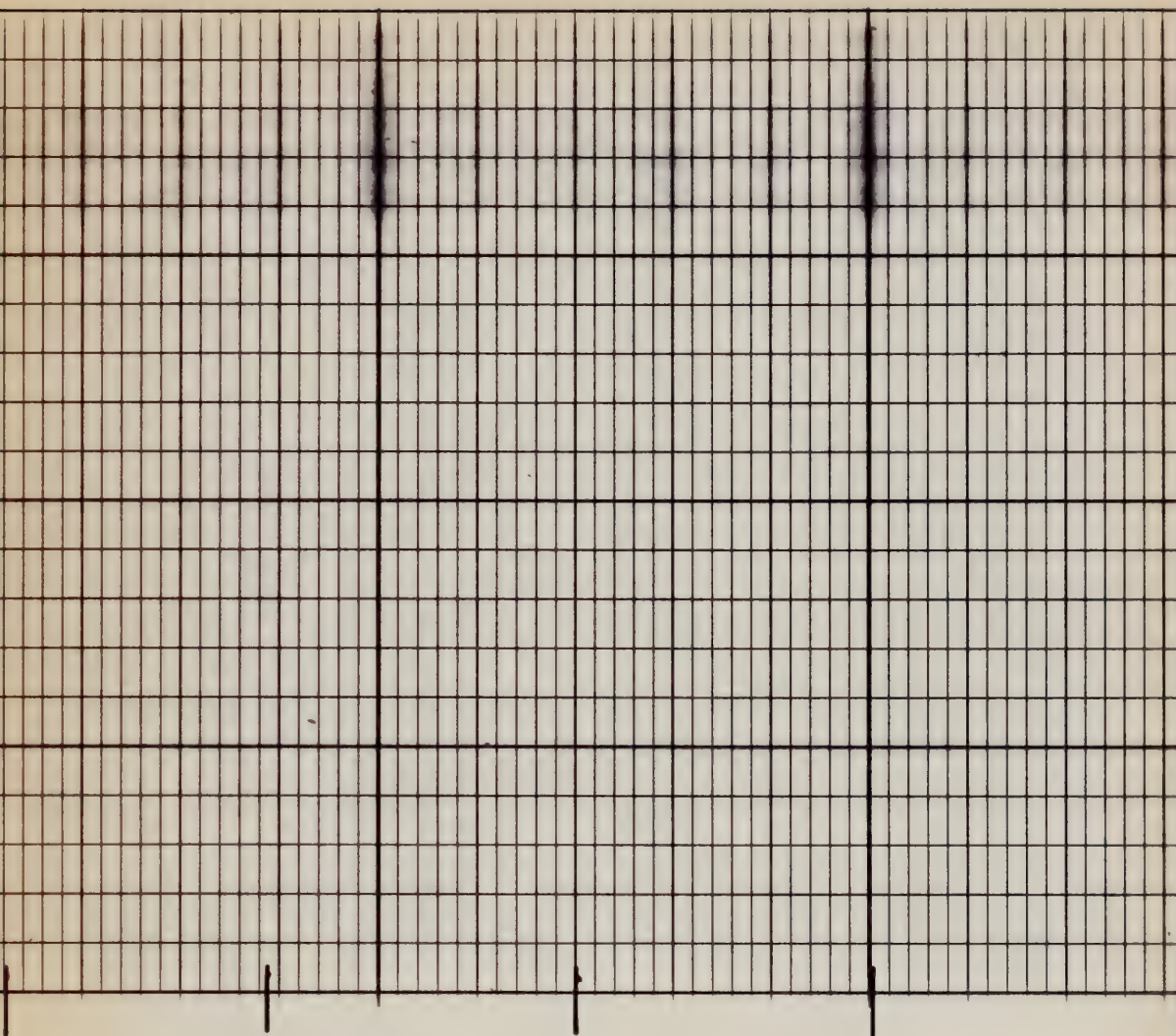
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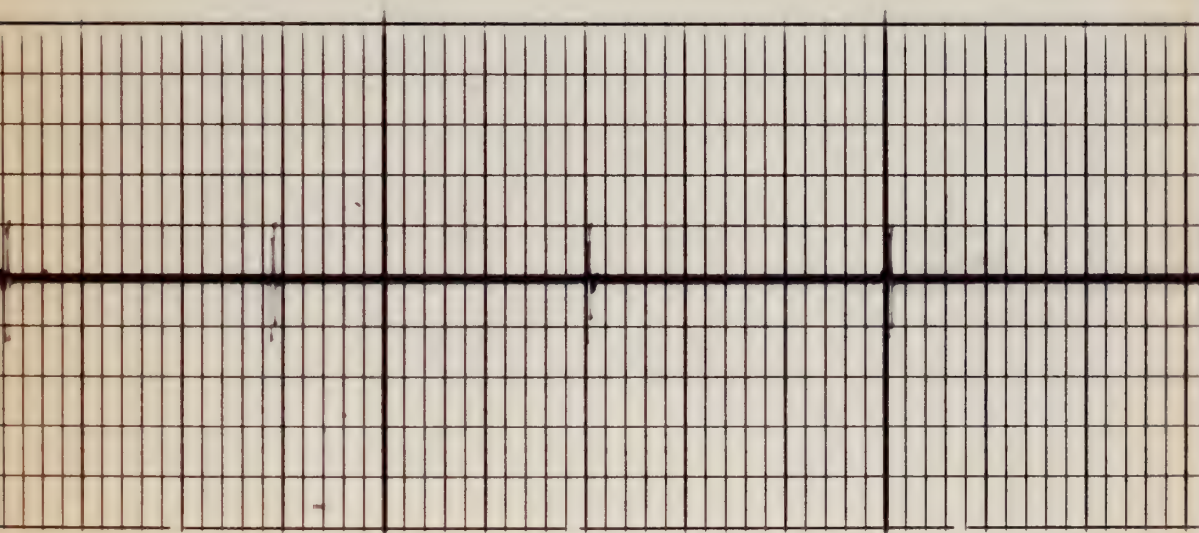


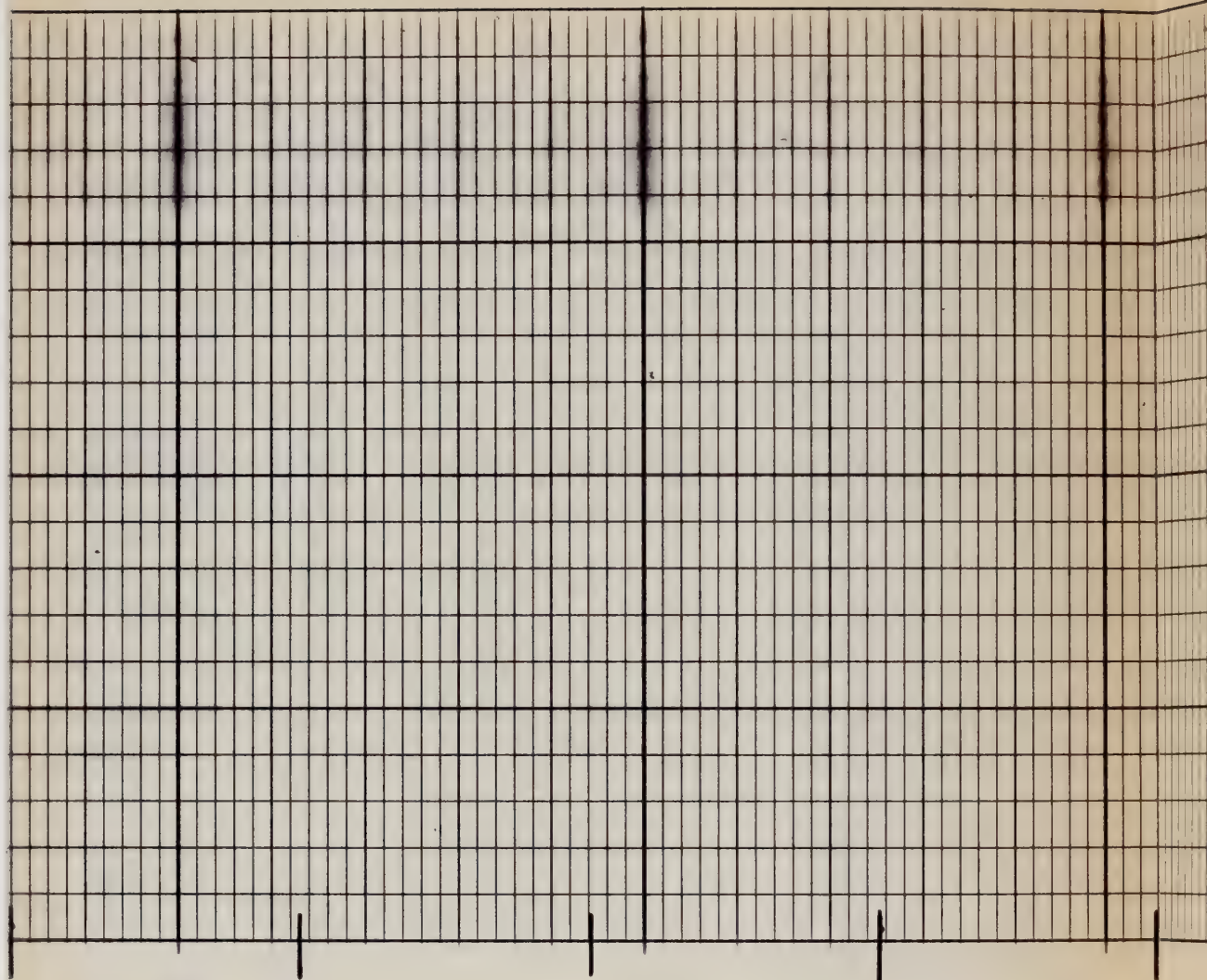
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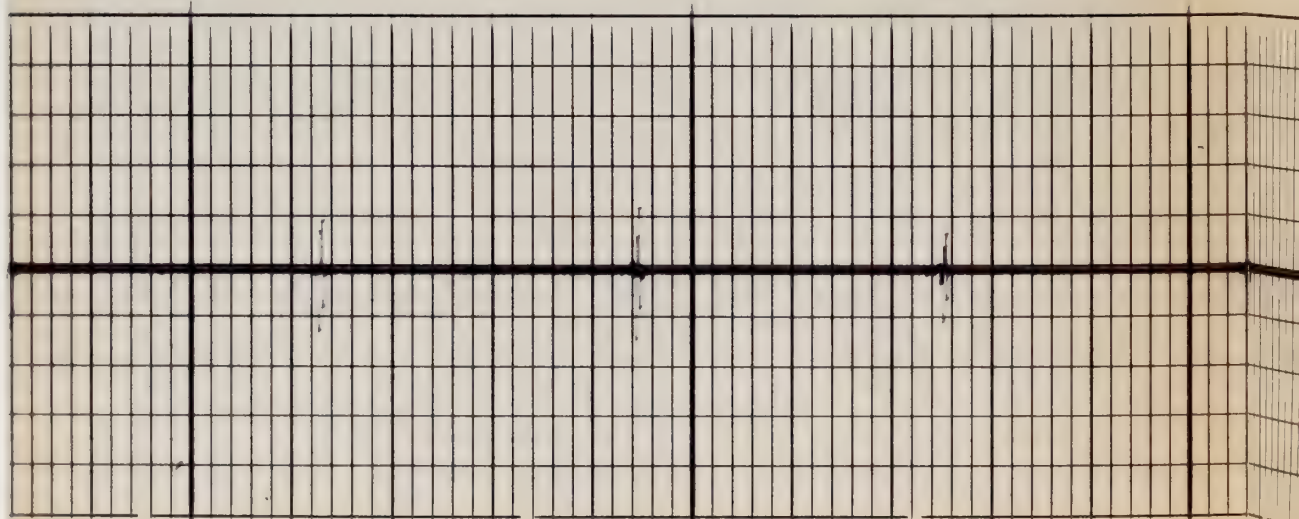
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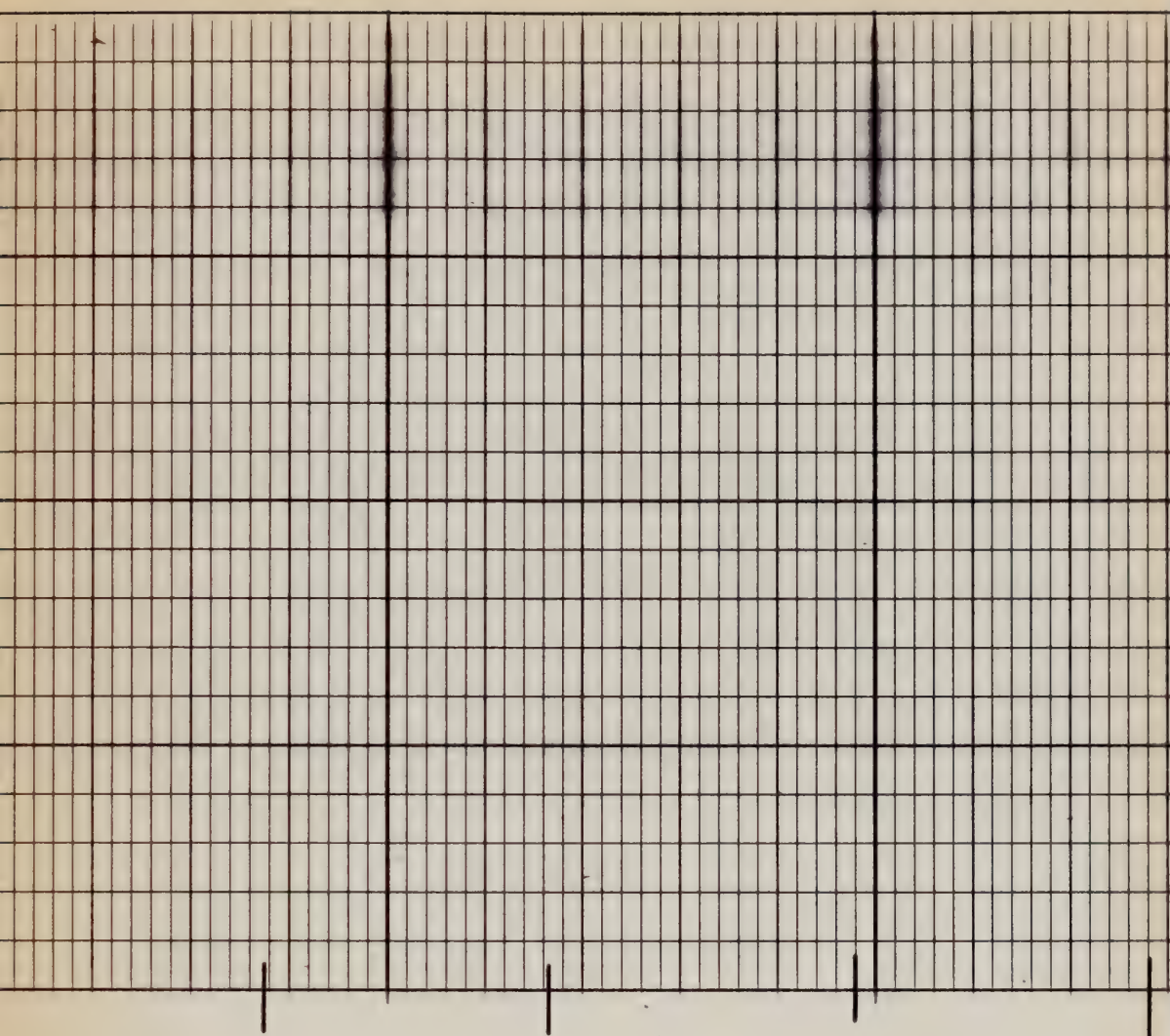




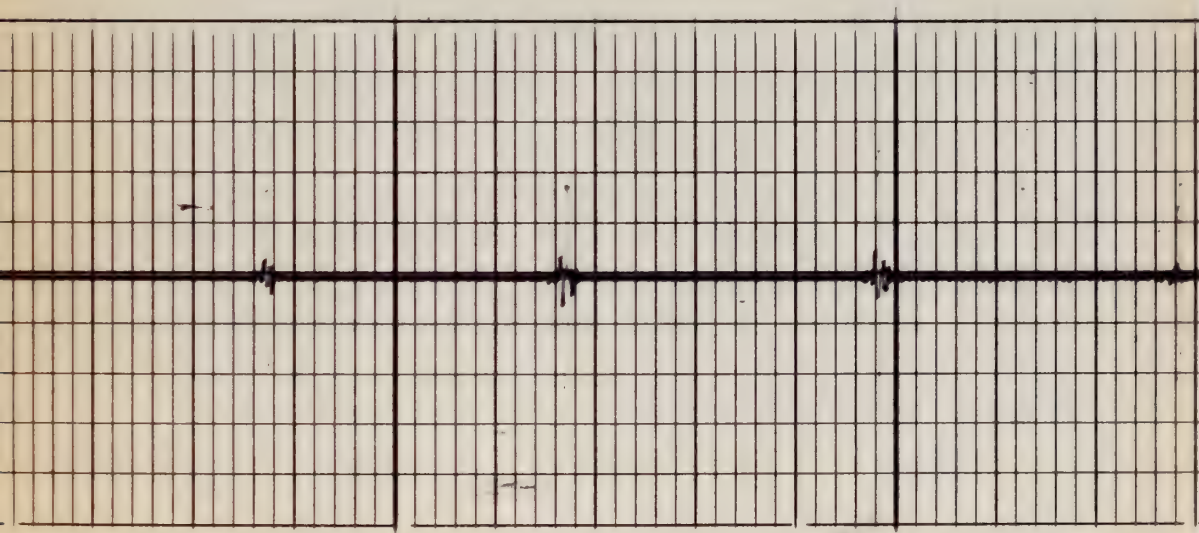
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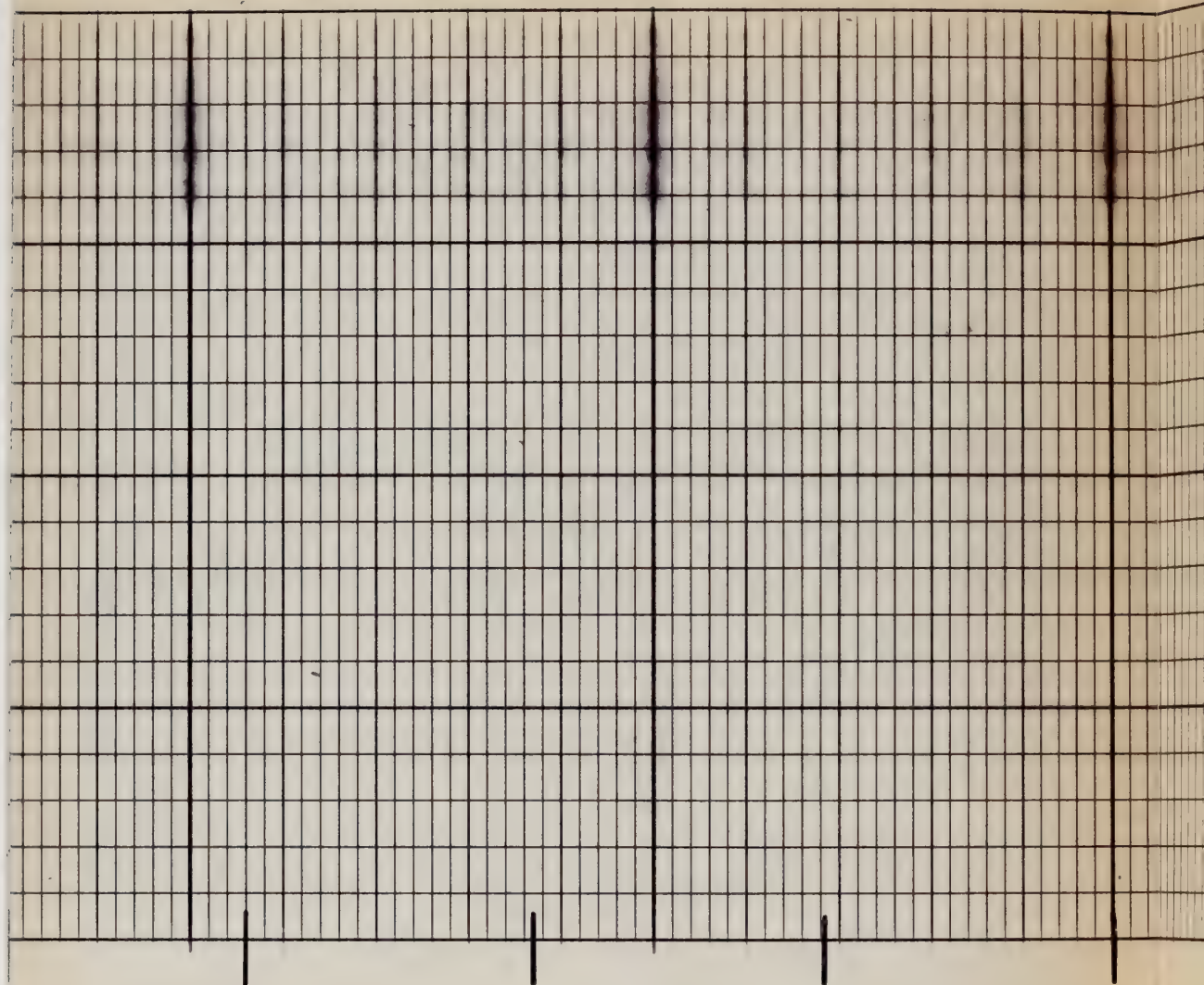
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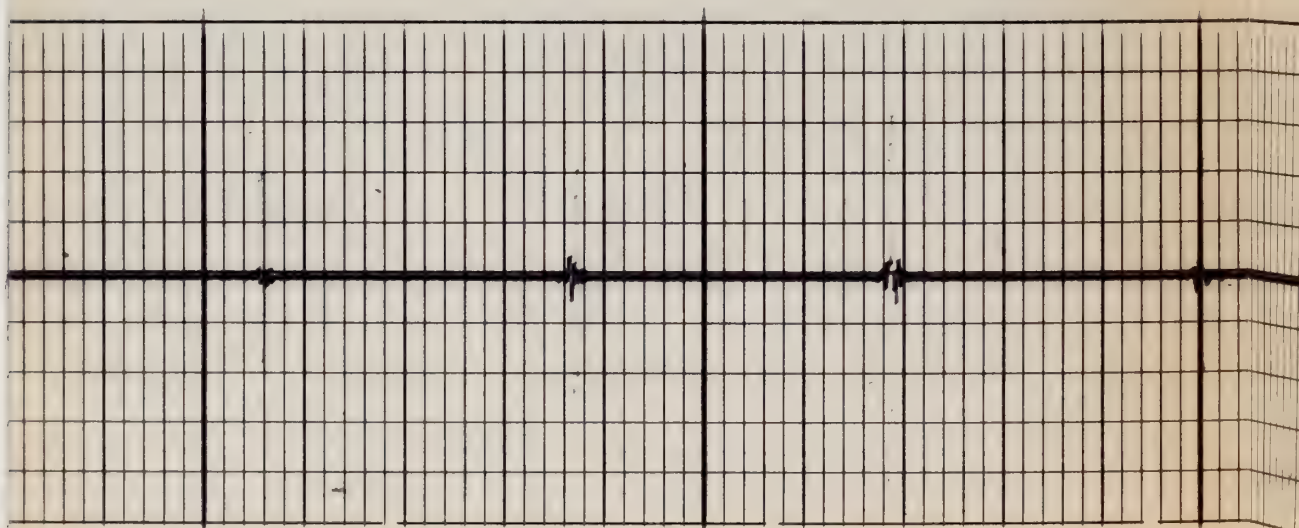


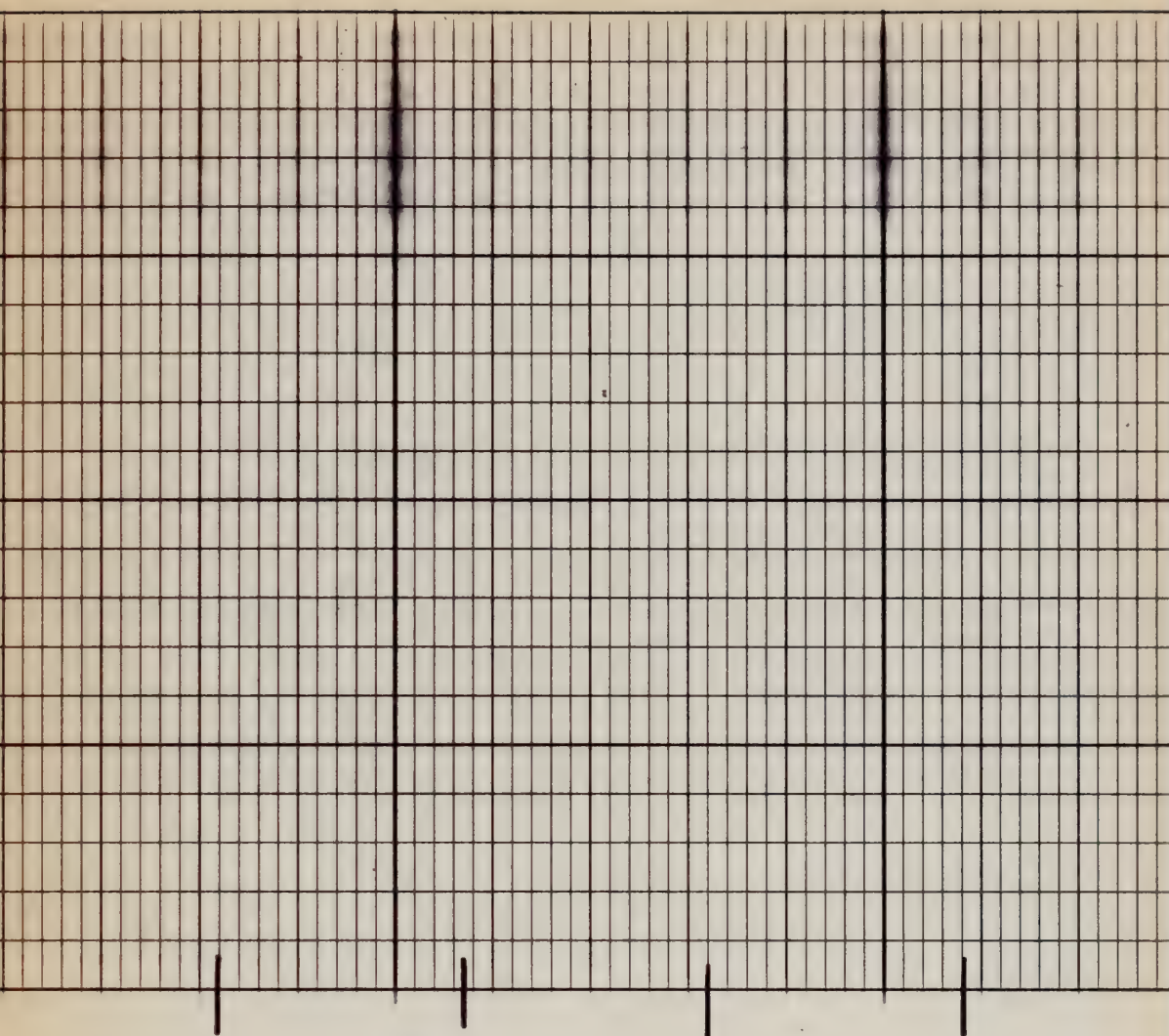
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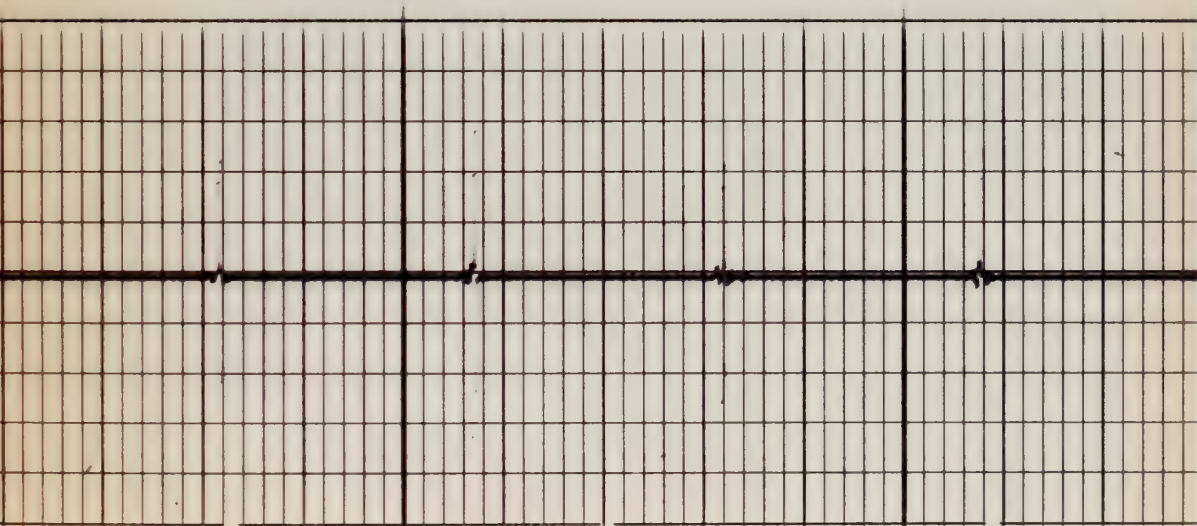


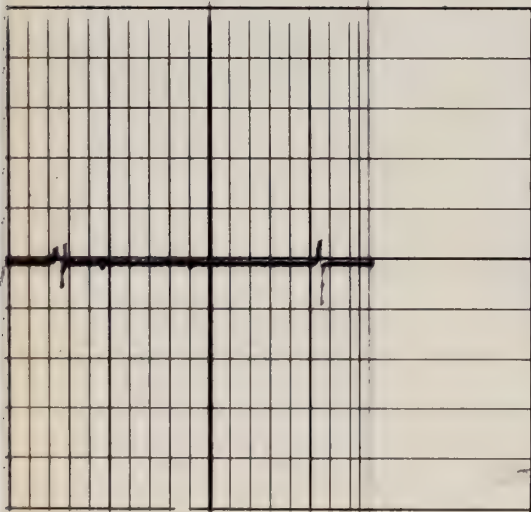
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2700



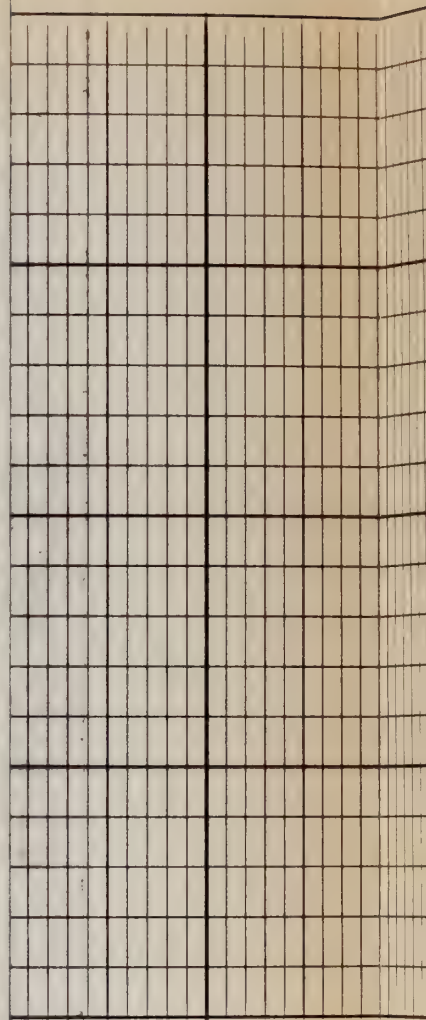


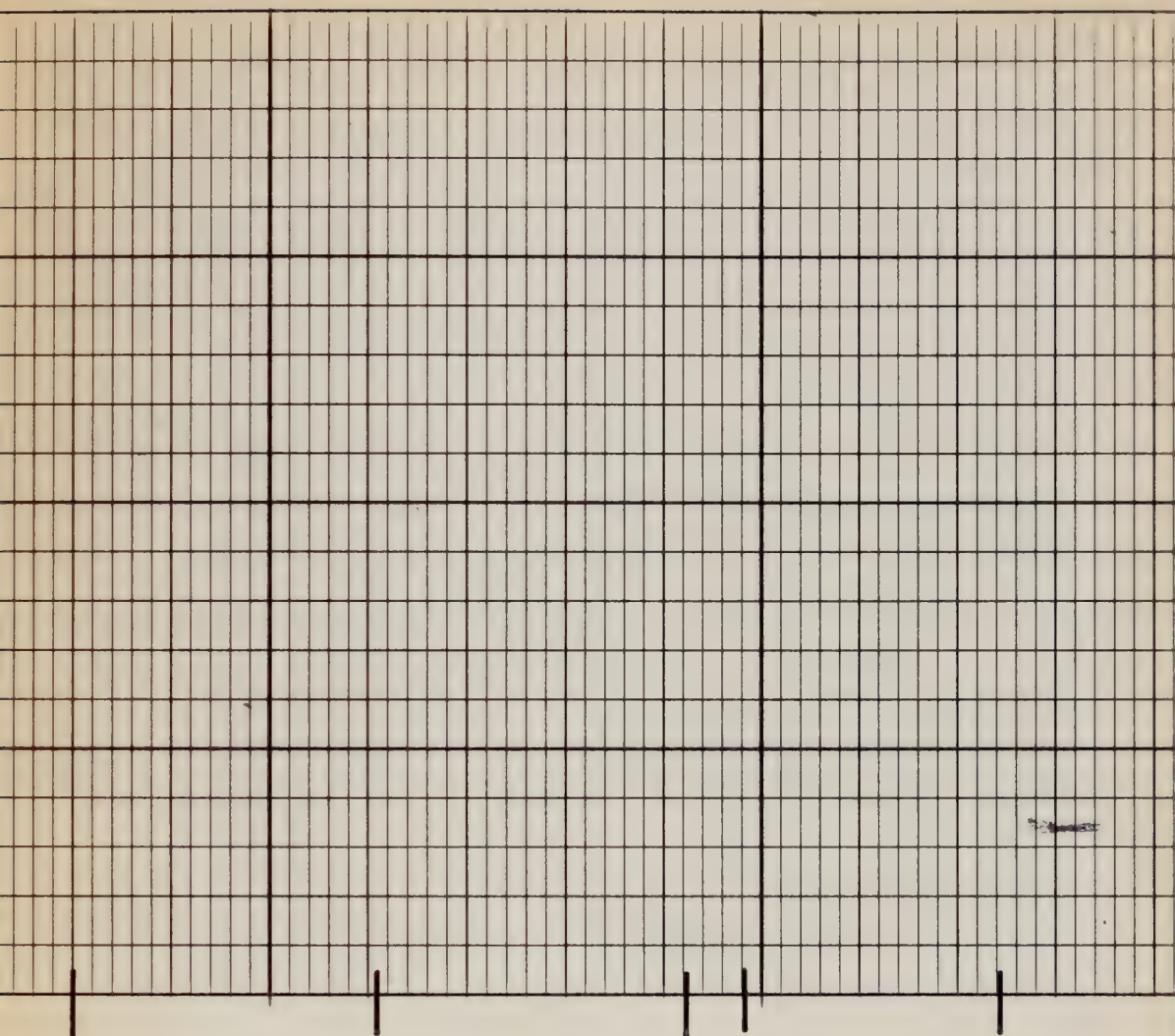
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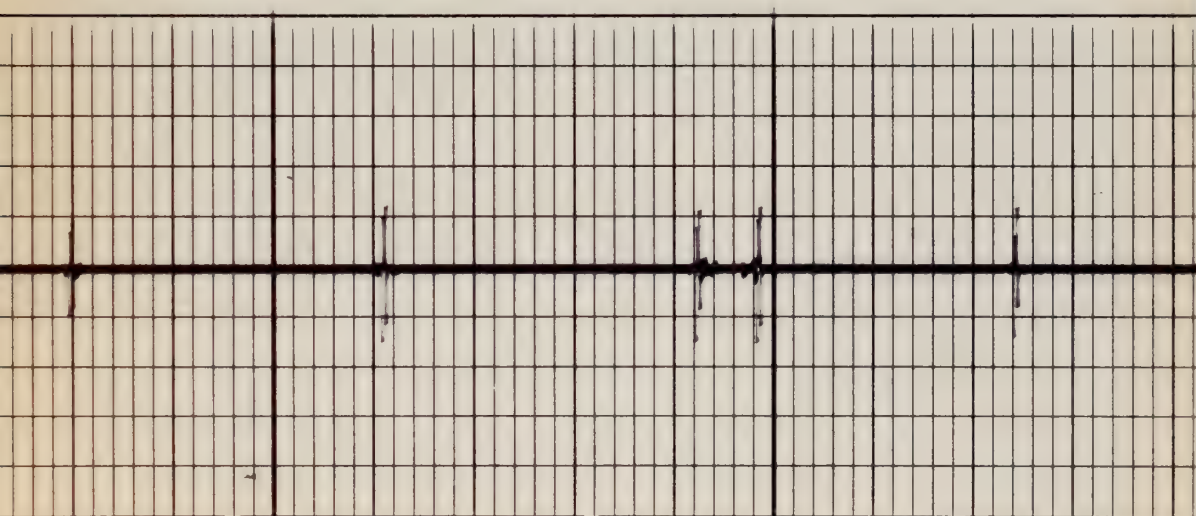
COLLAR LOG RUN BEFORE
PERFORATING UPPER
ZONES WITH 11/16"
HYPERDOME AND AFTER
PERFORATING LOWER
ZONES WITH 11/16"
UNIT CERAMIC
EXTENDABLE JETS

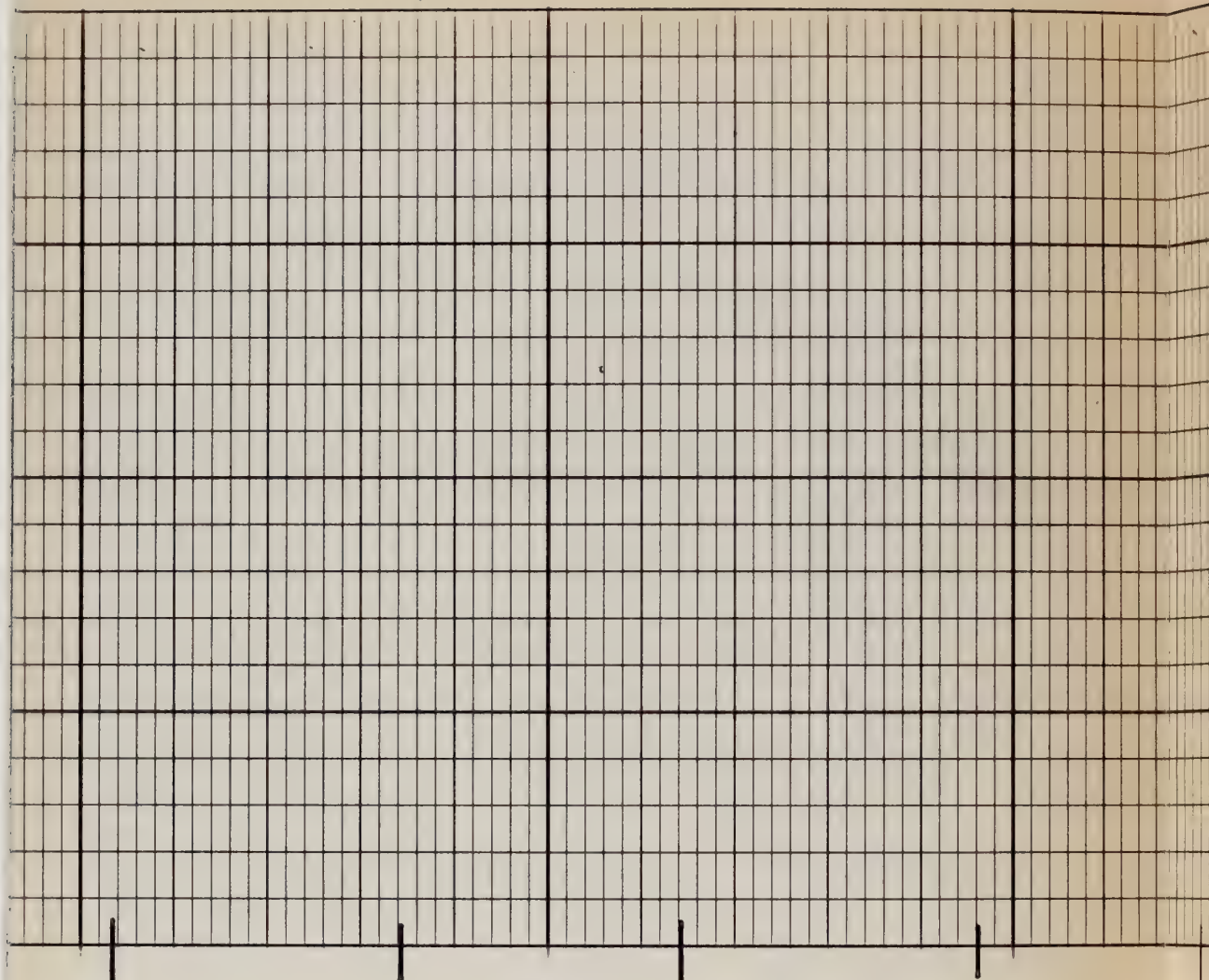
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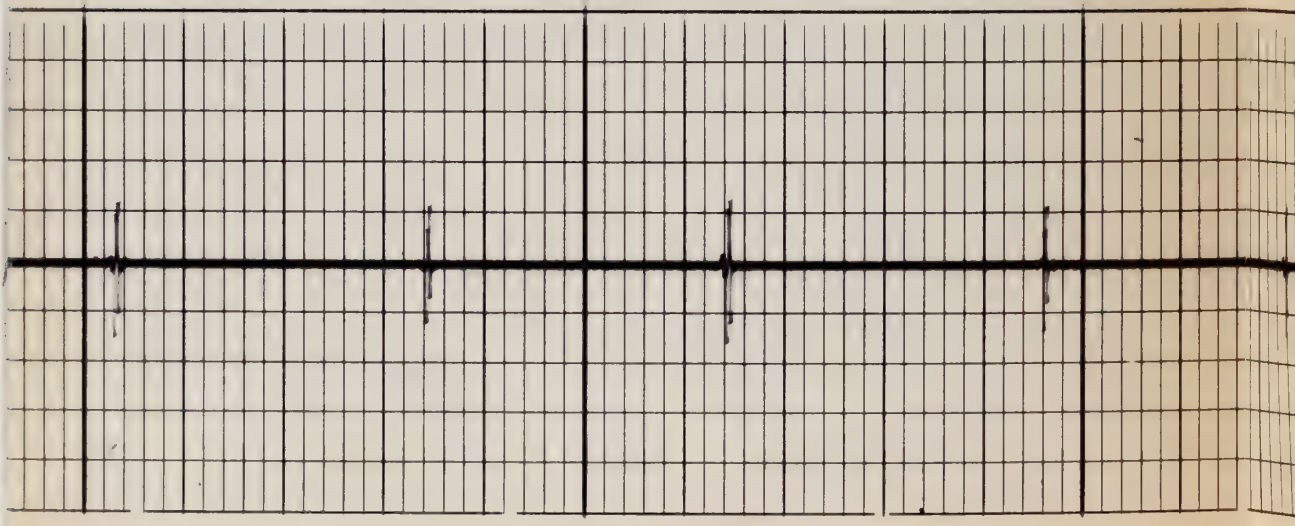


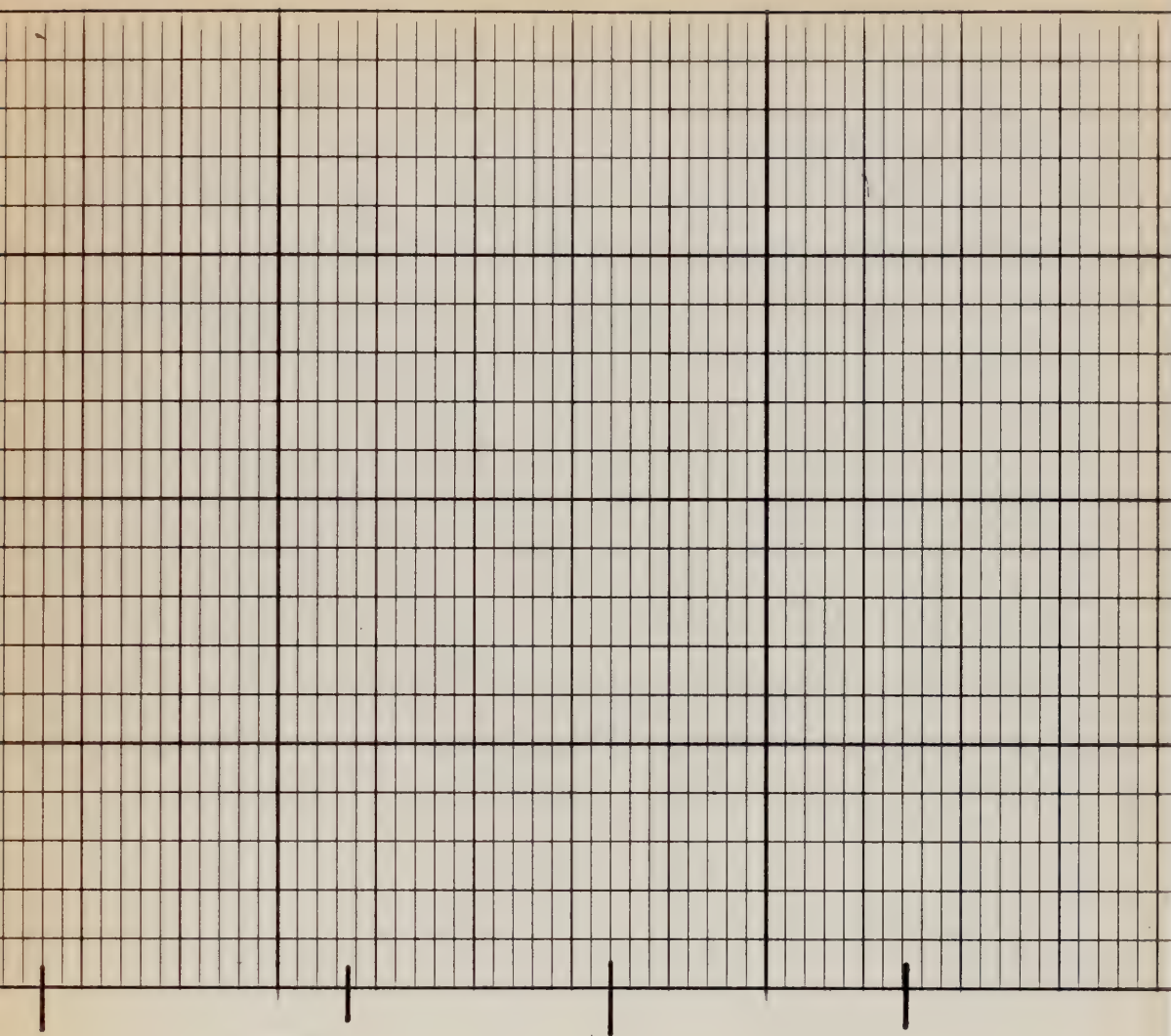
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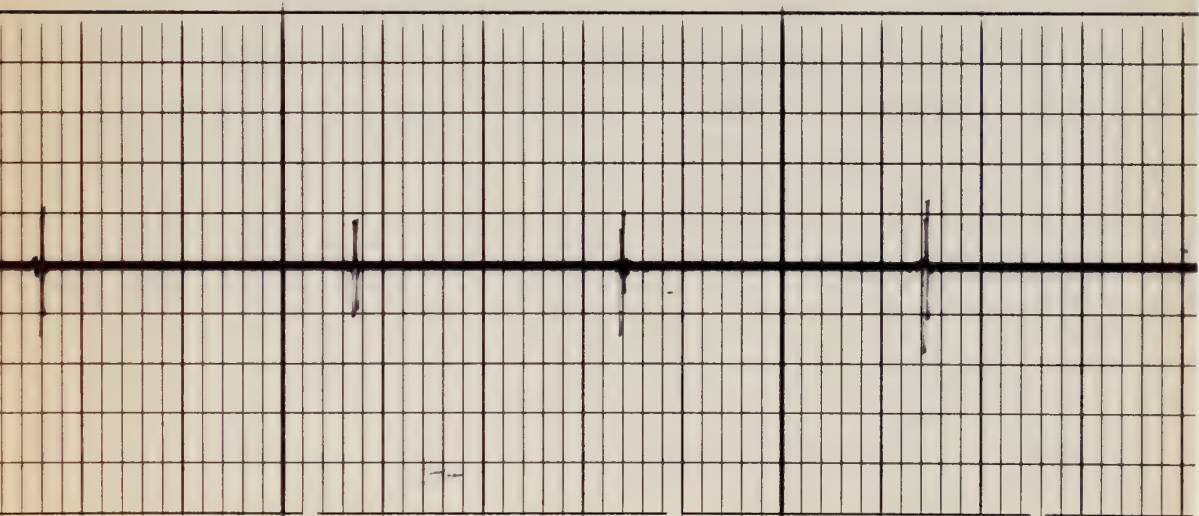


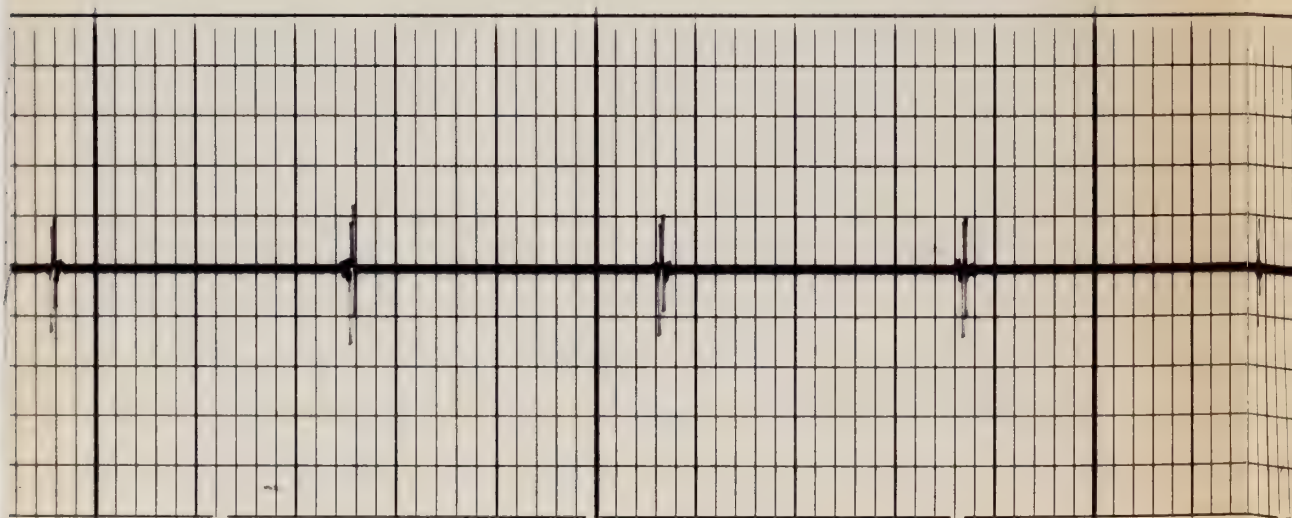
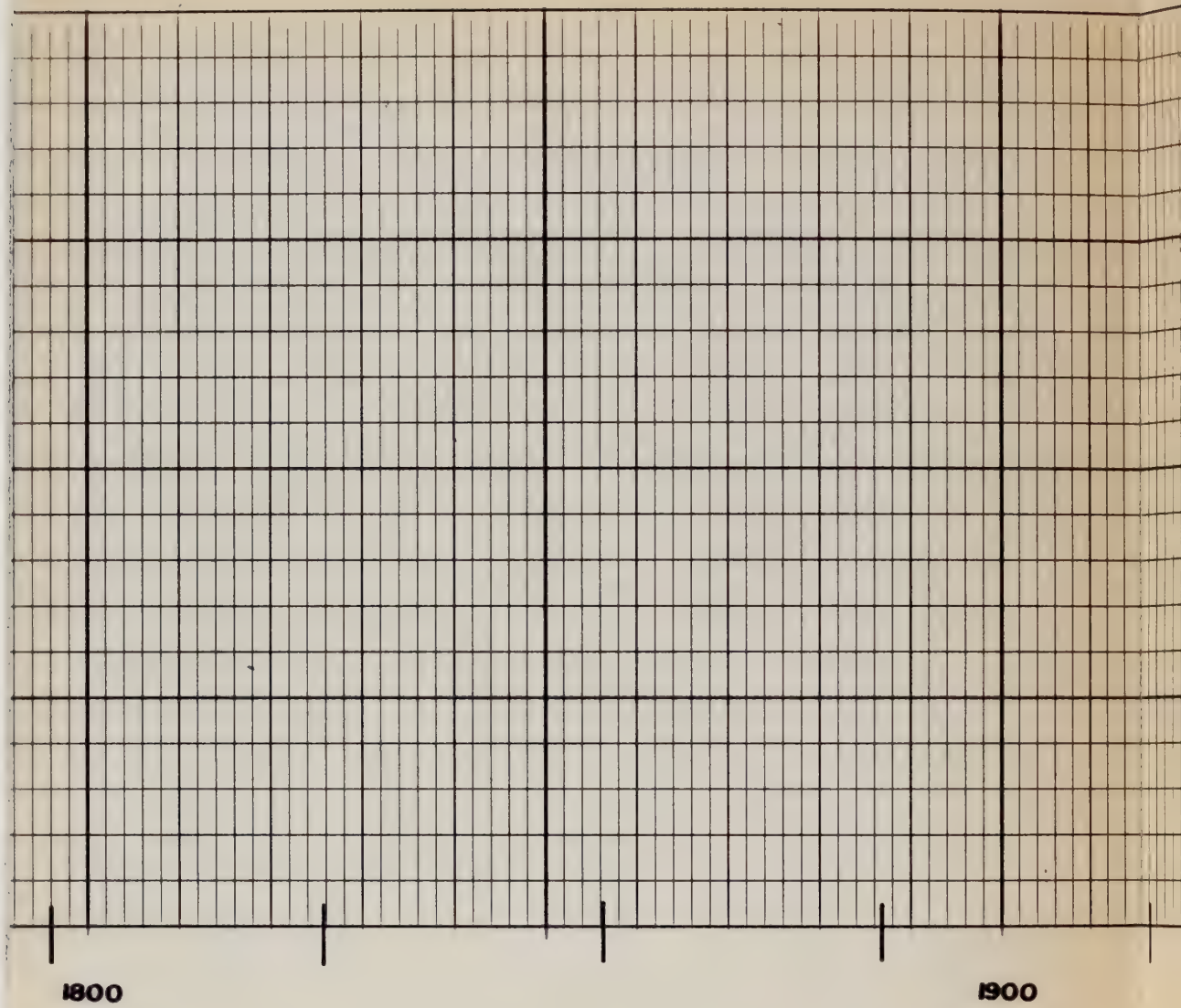
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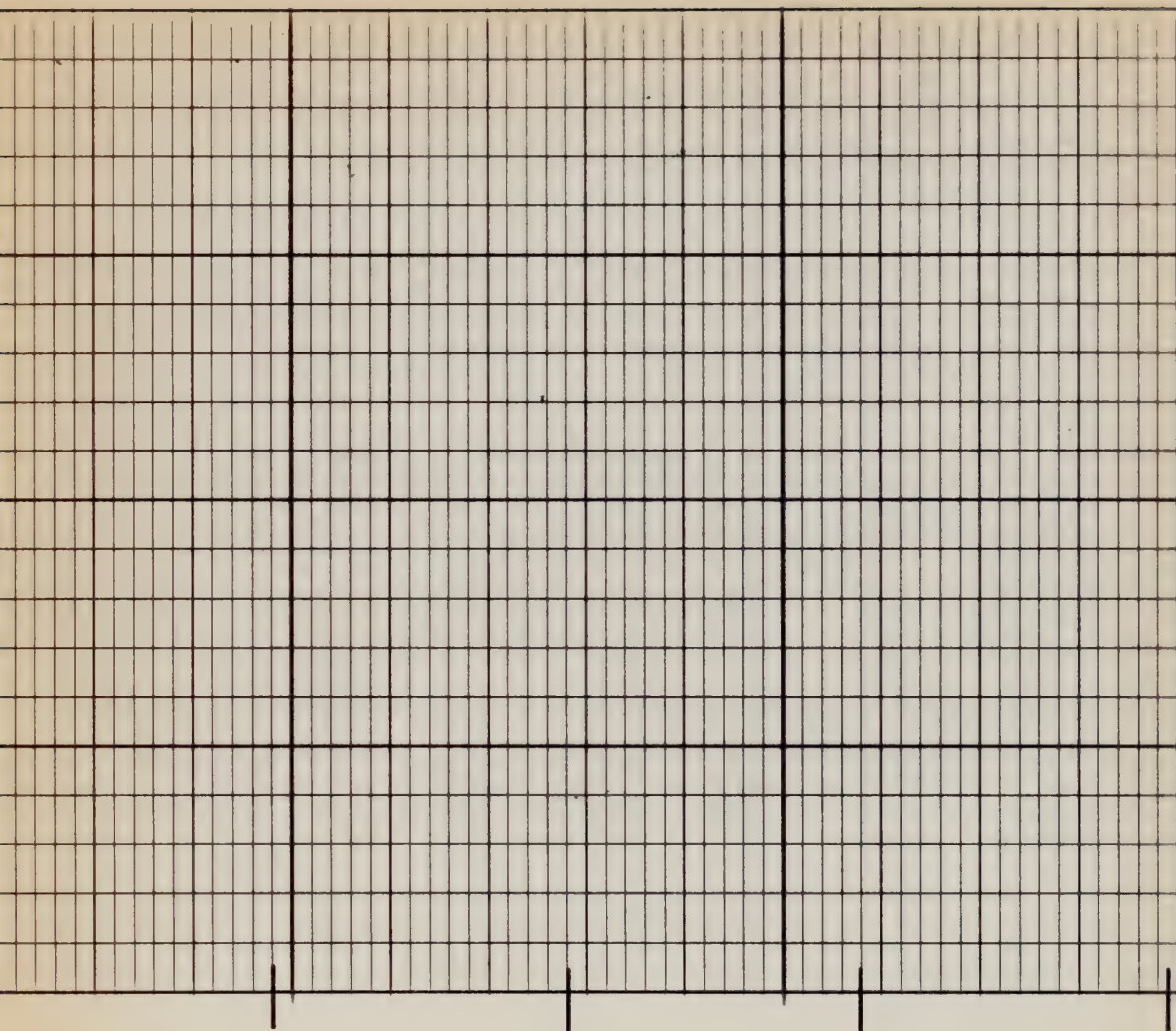




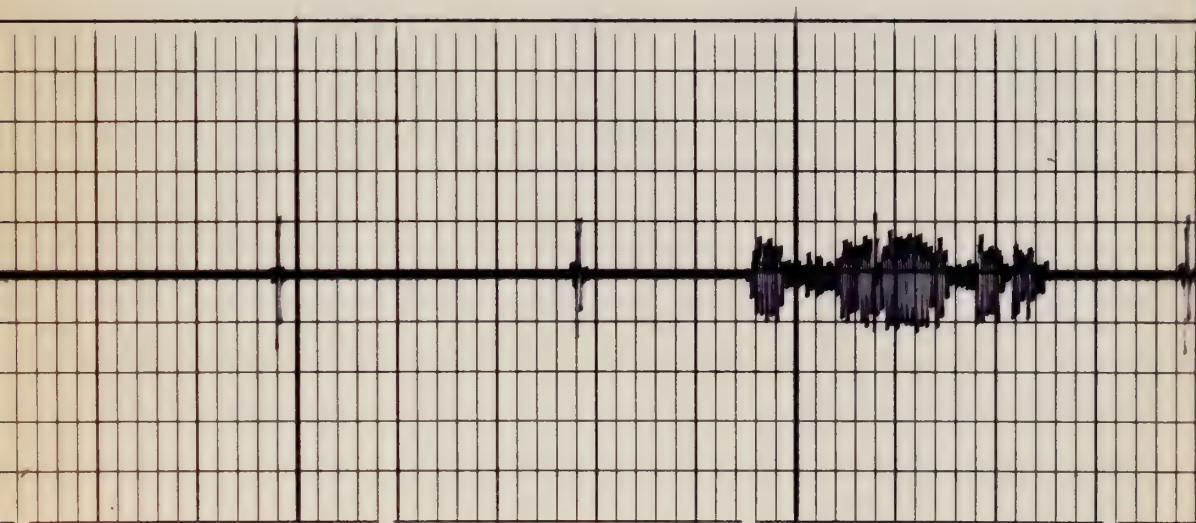
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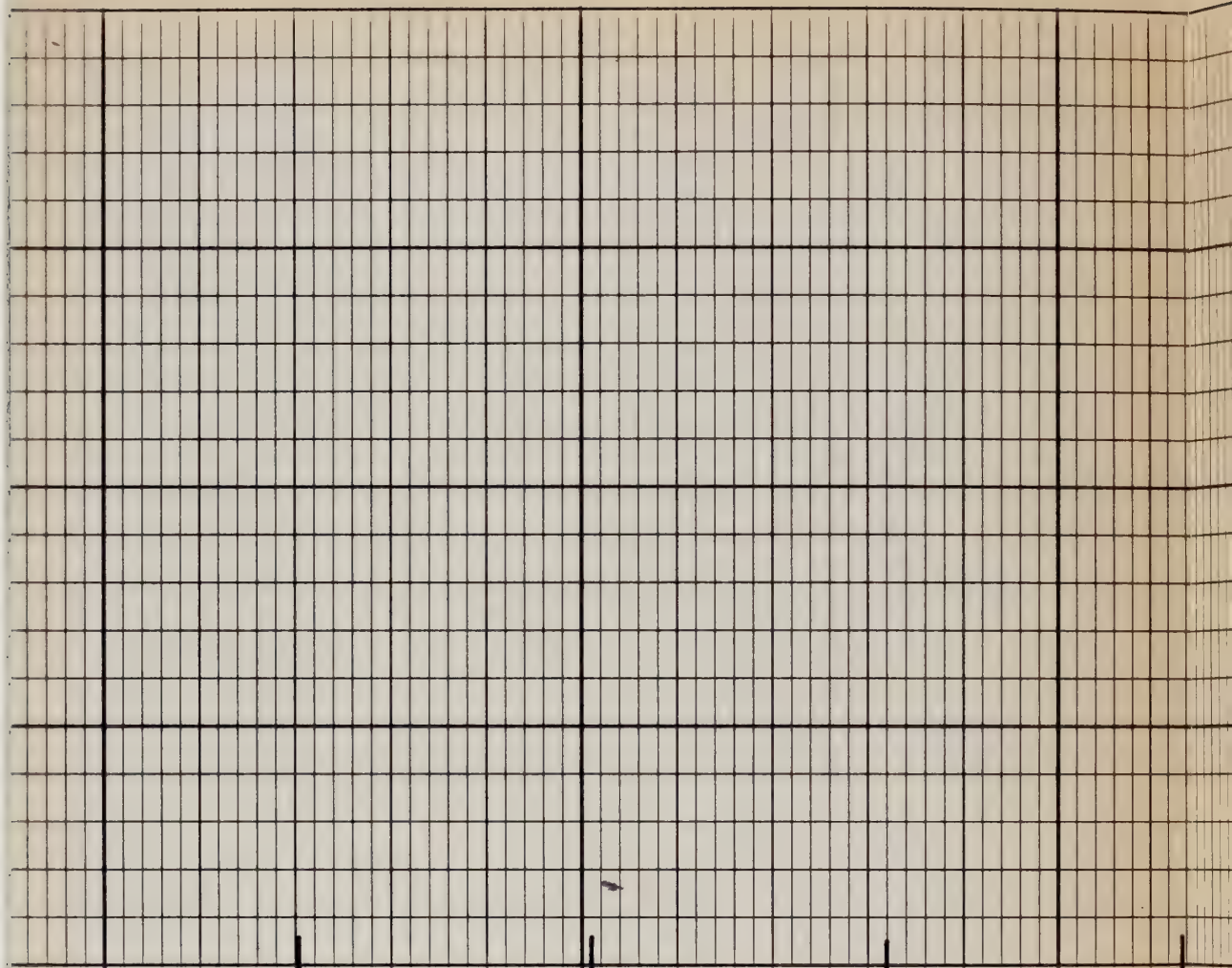




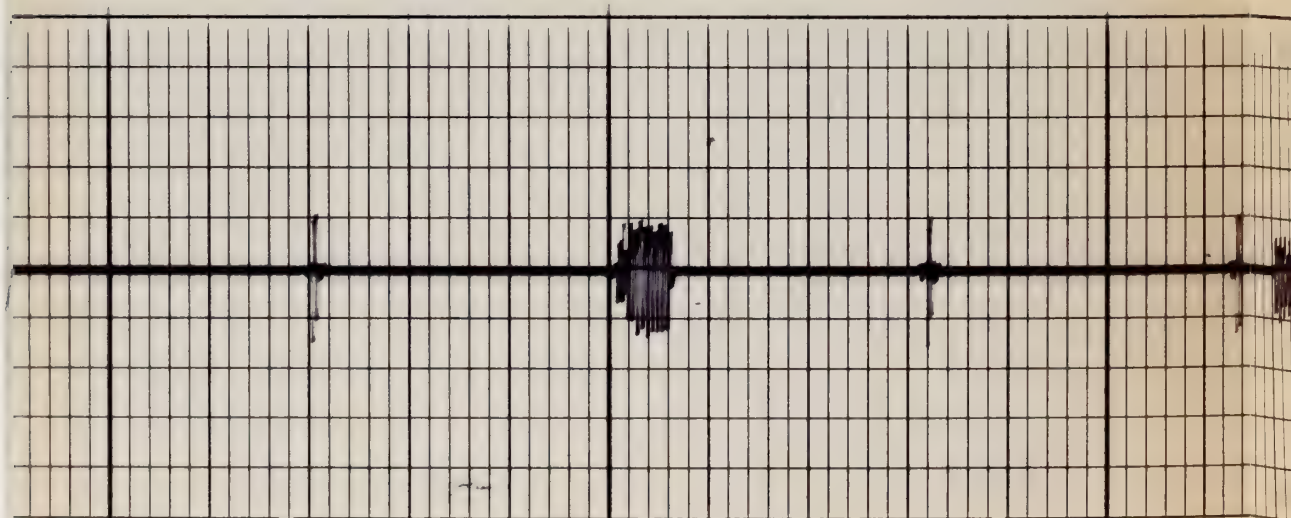


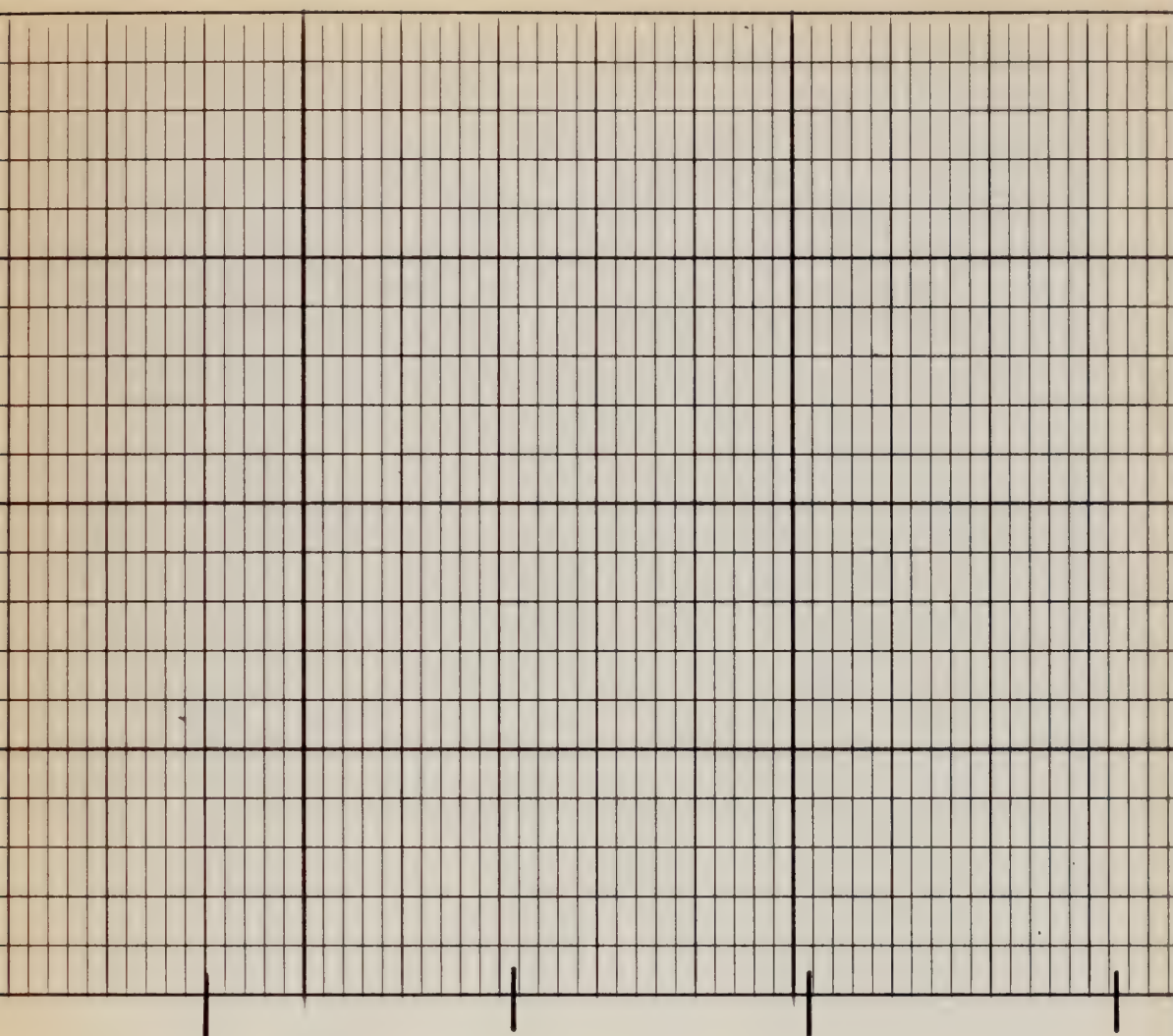
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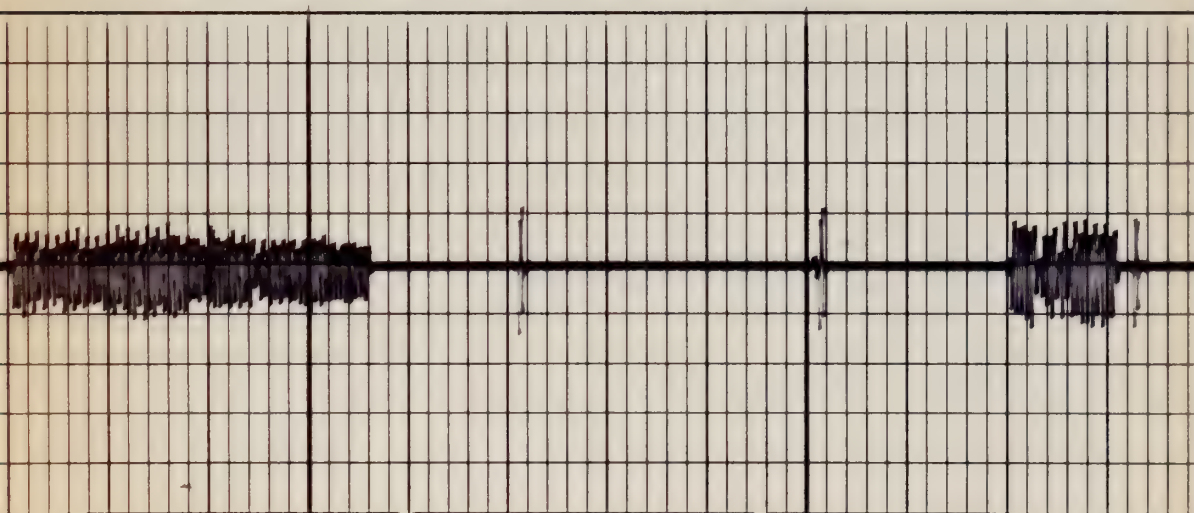


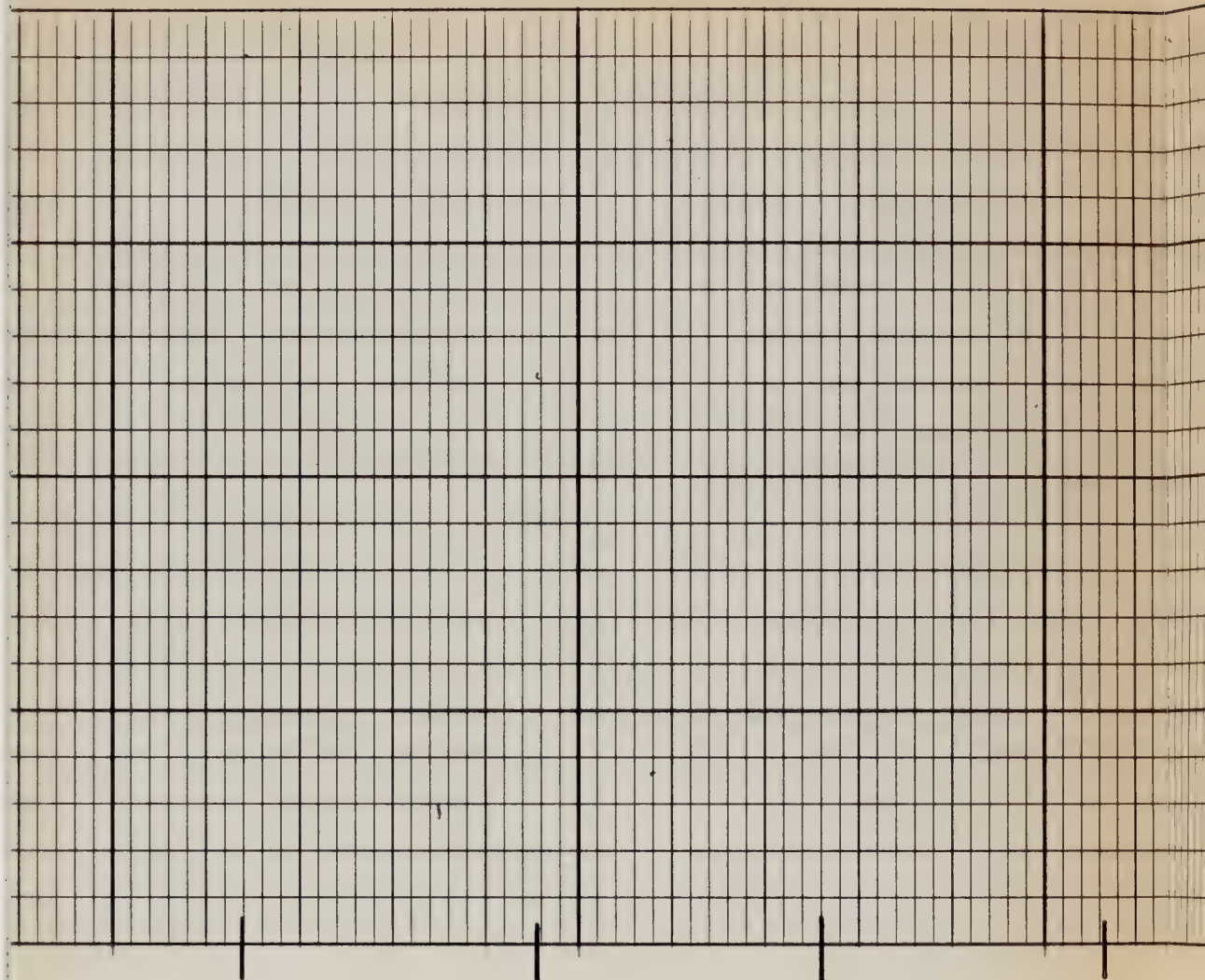
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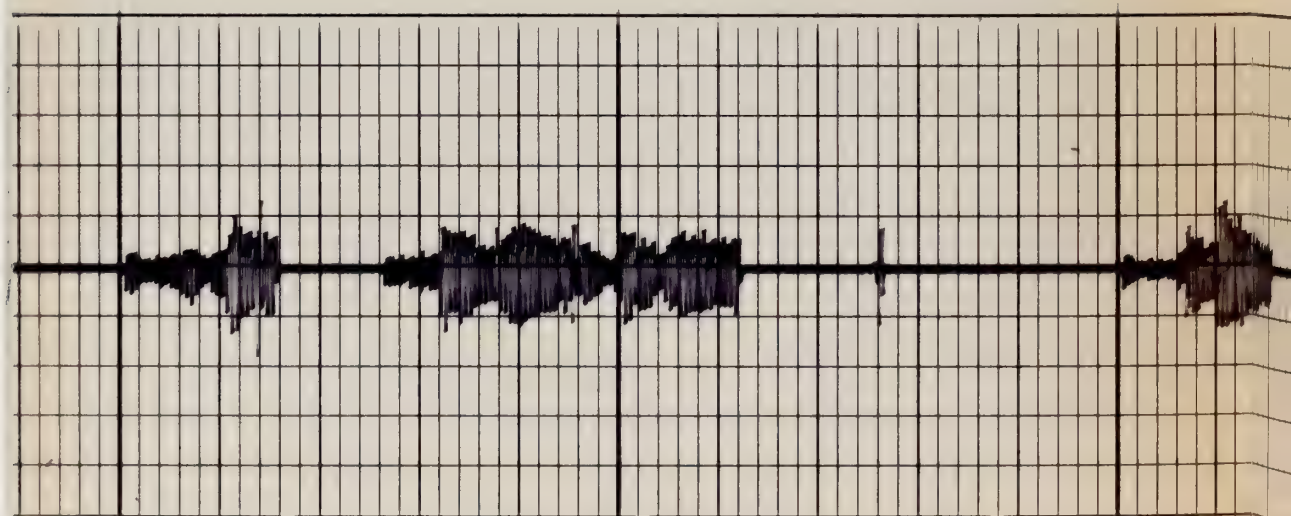
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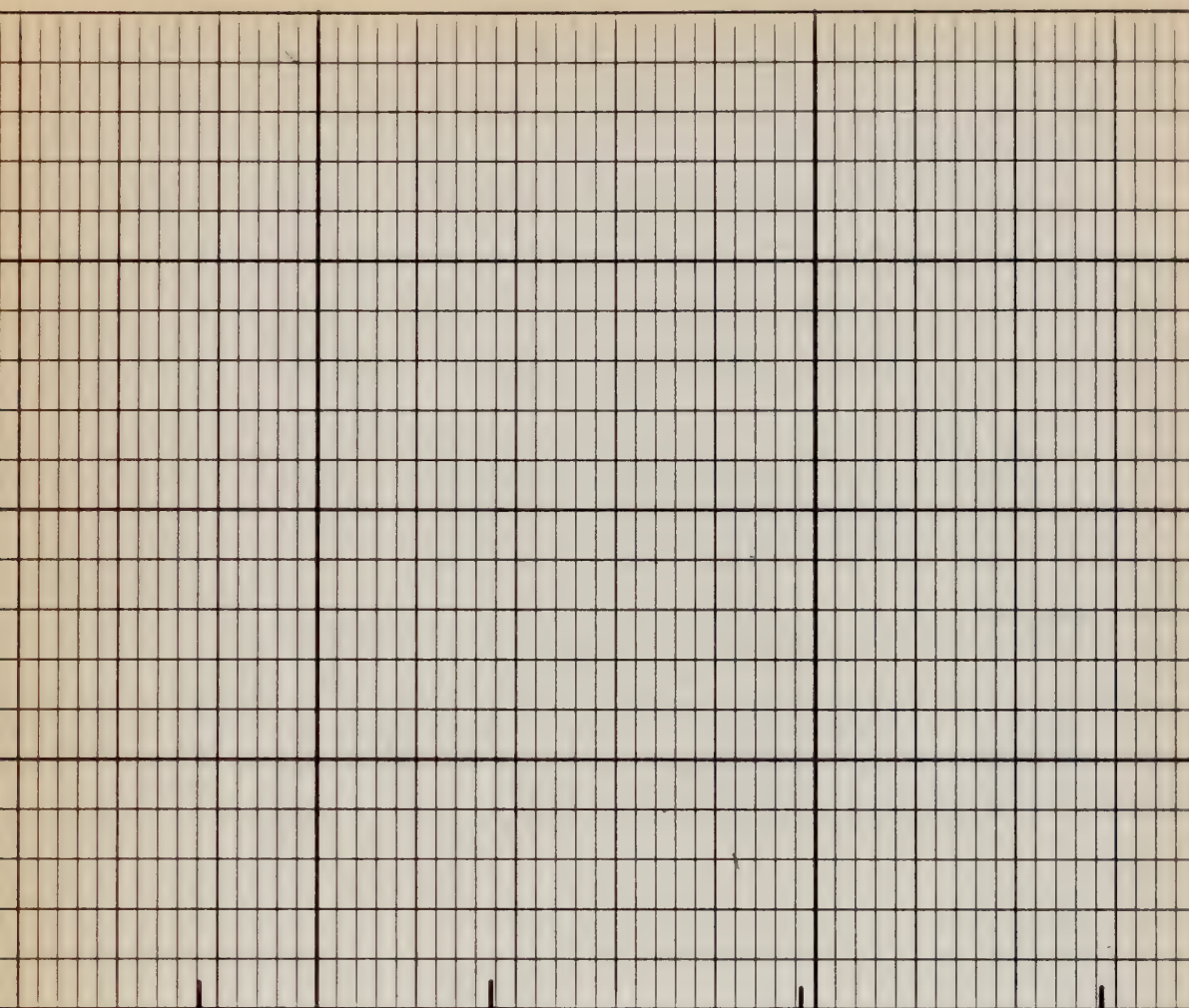




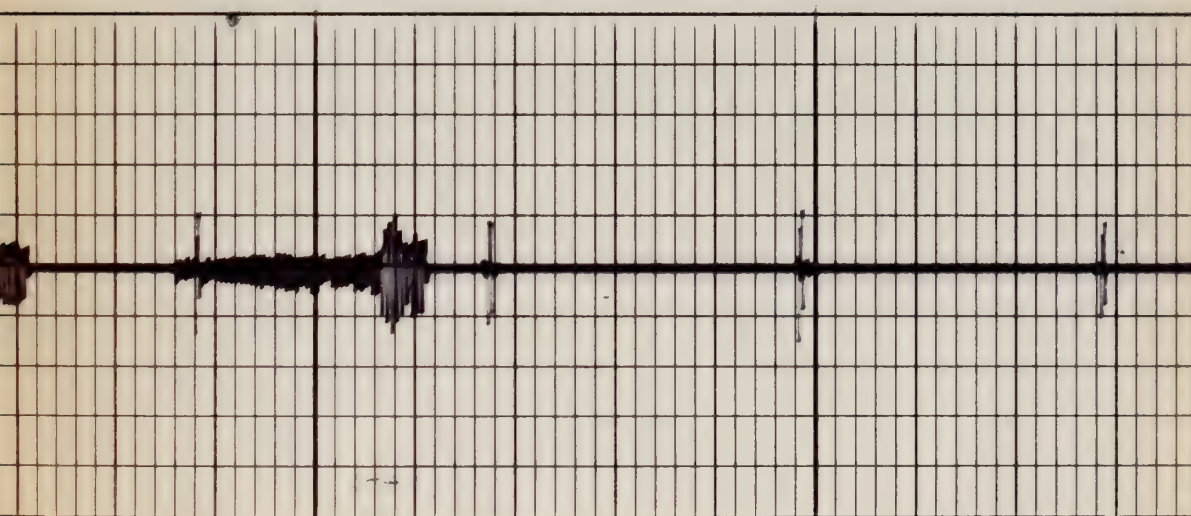
2300

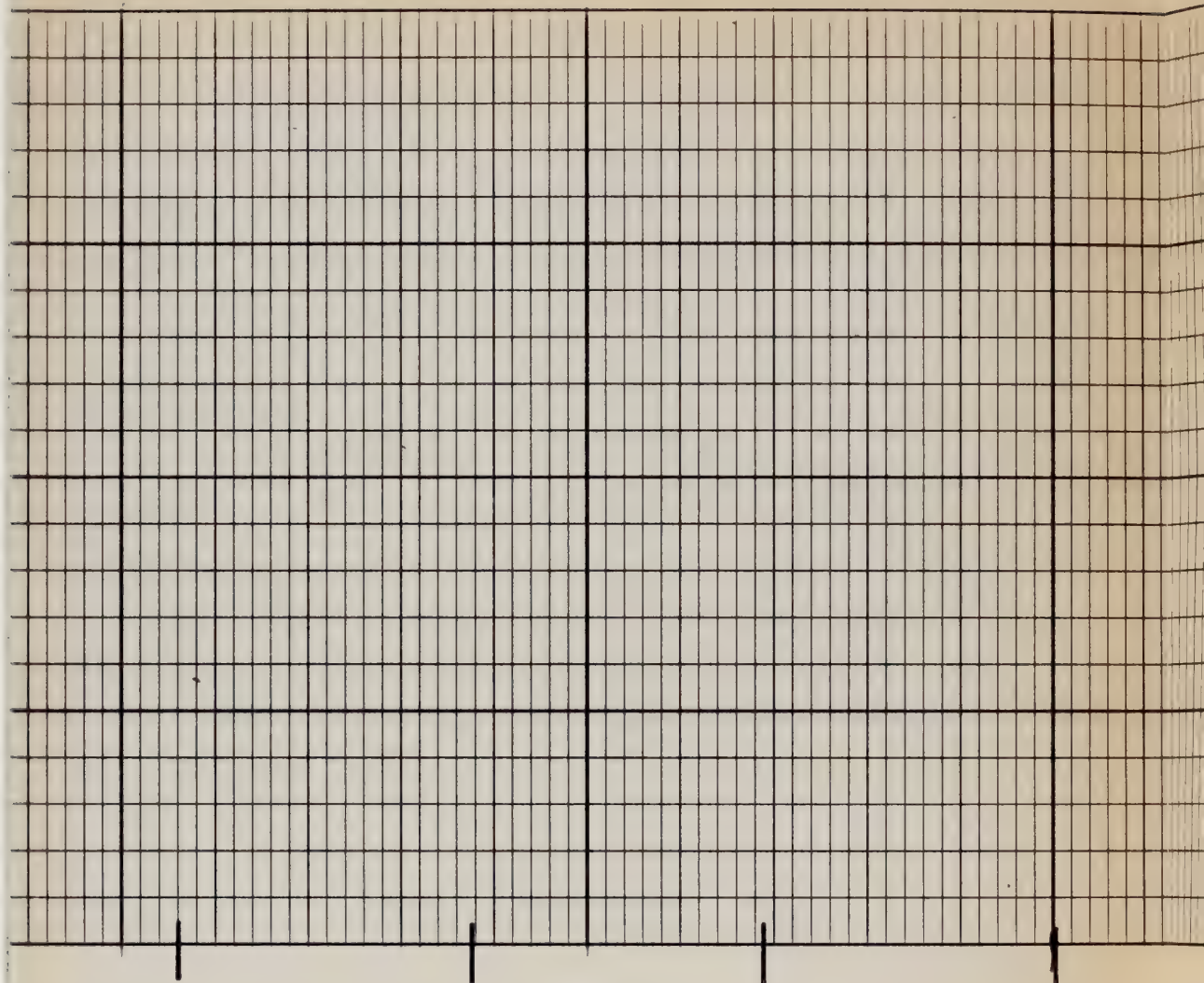
2400



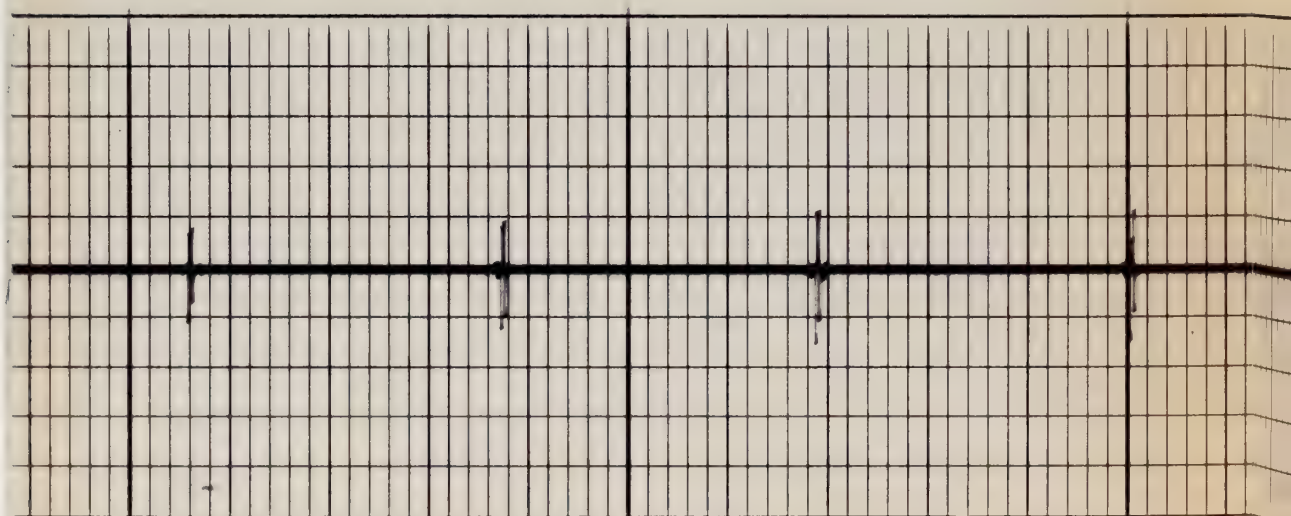


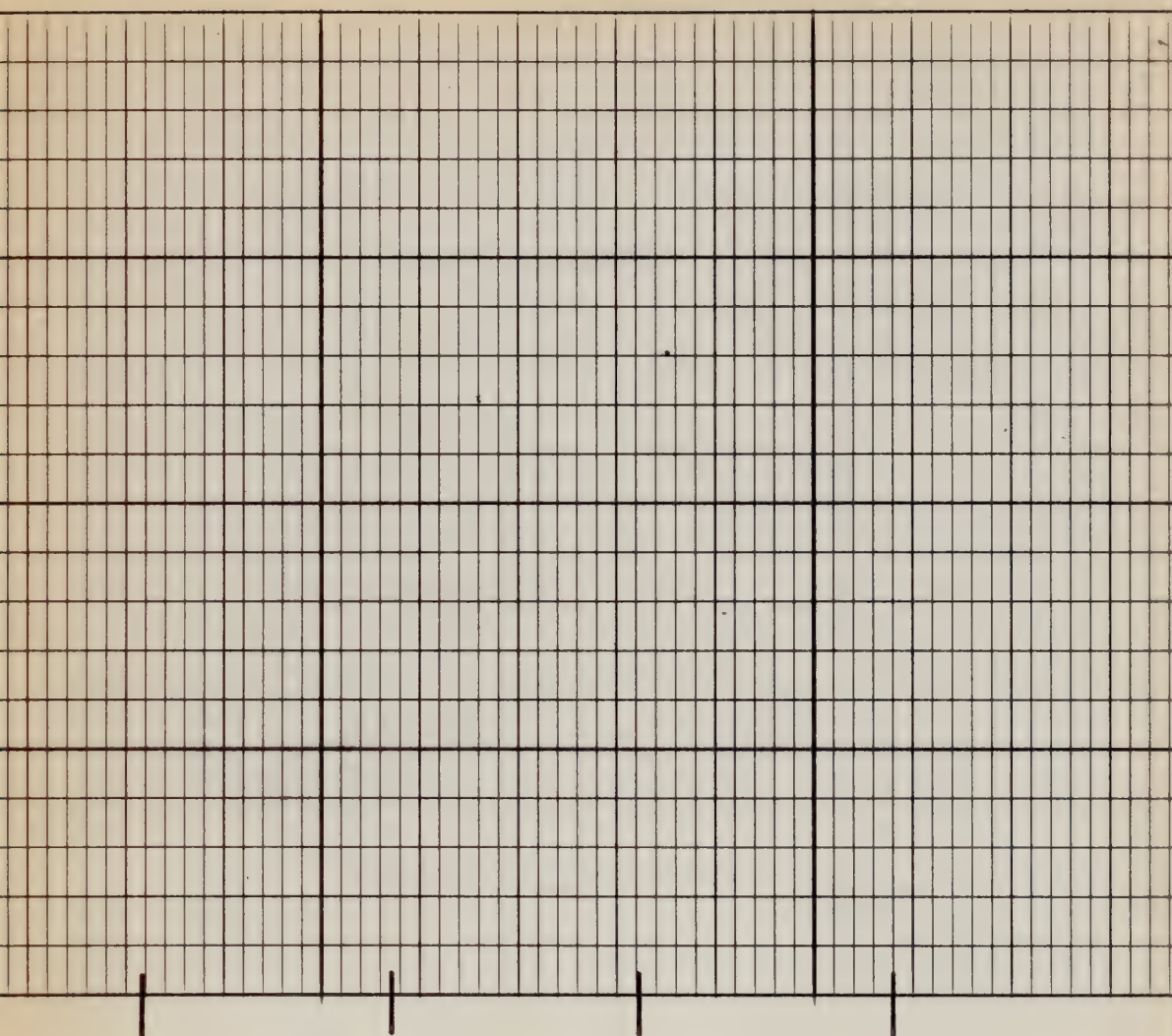
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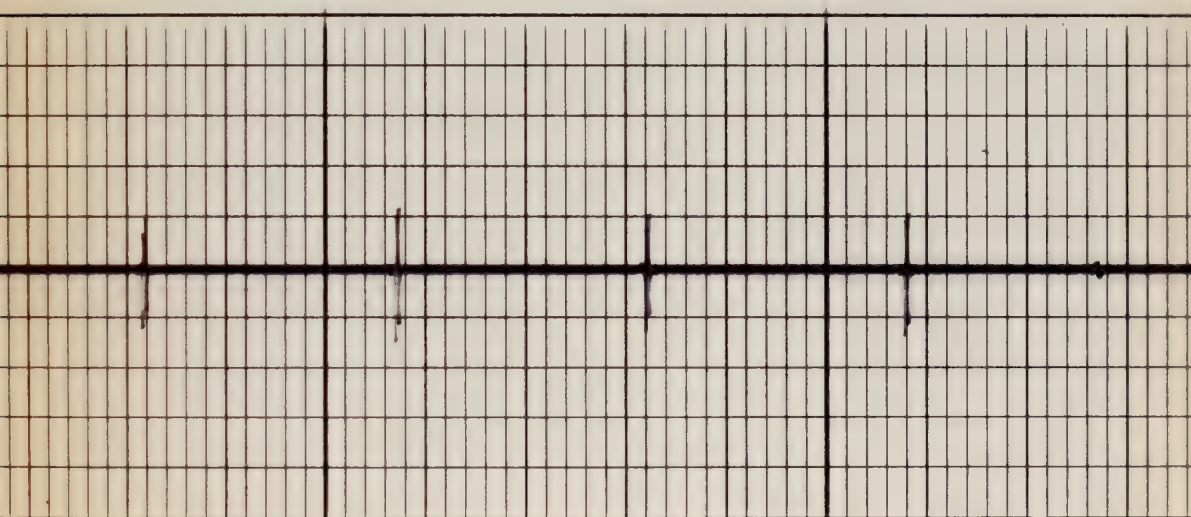


2600





2700



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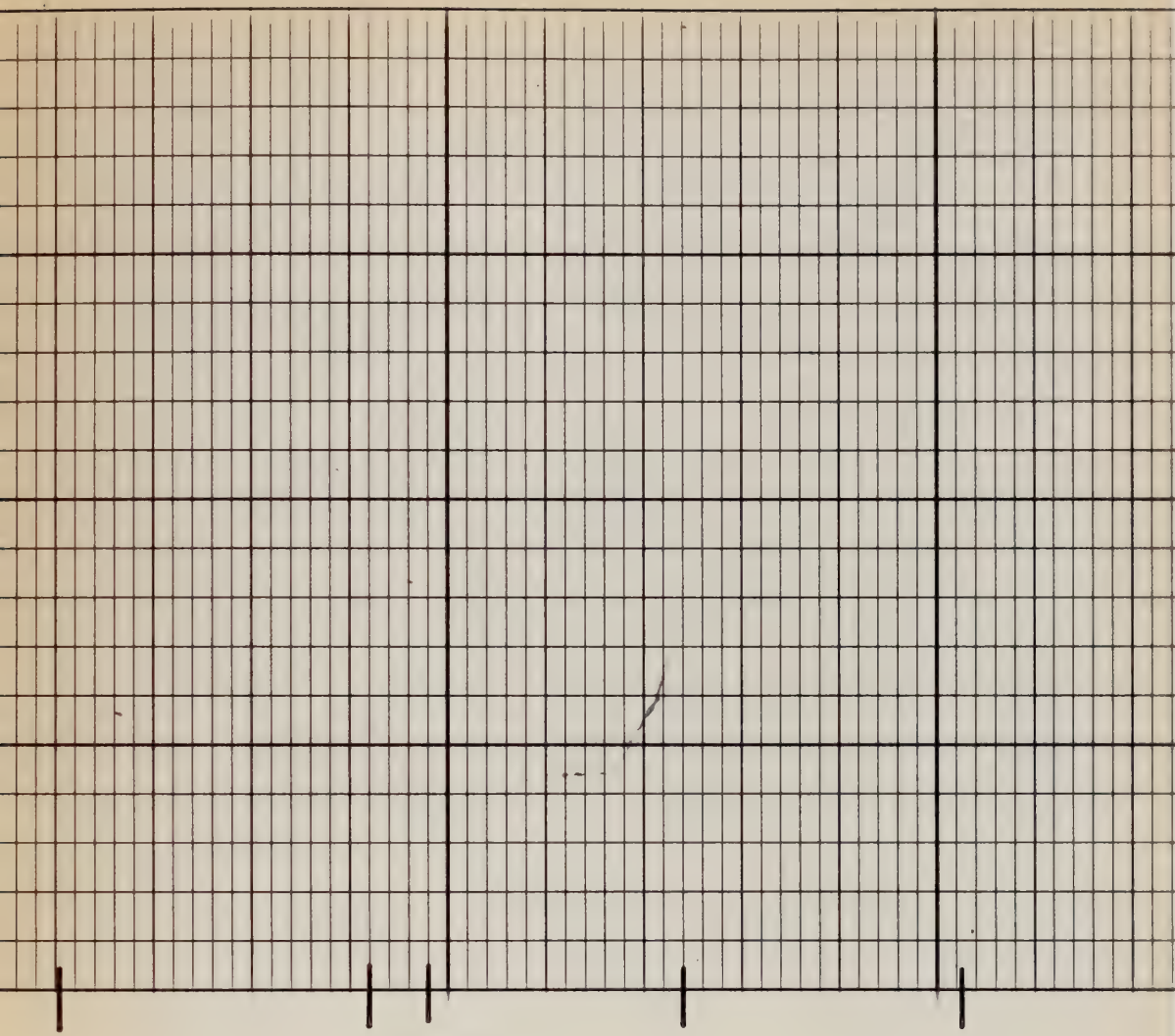
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	- CASING COLLAR LOG AFTER PERFORATION	
DEPTHS		

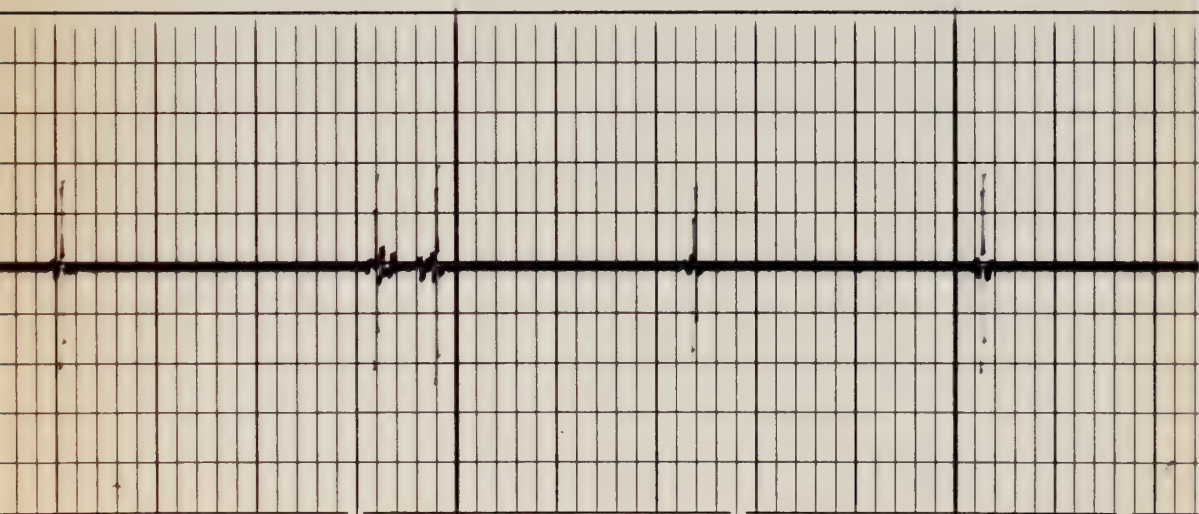
NO. 1 LONG STRING

COLLAR LOG RUN AFTER PERFORATION

1400



1500



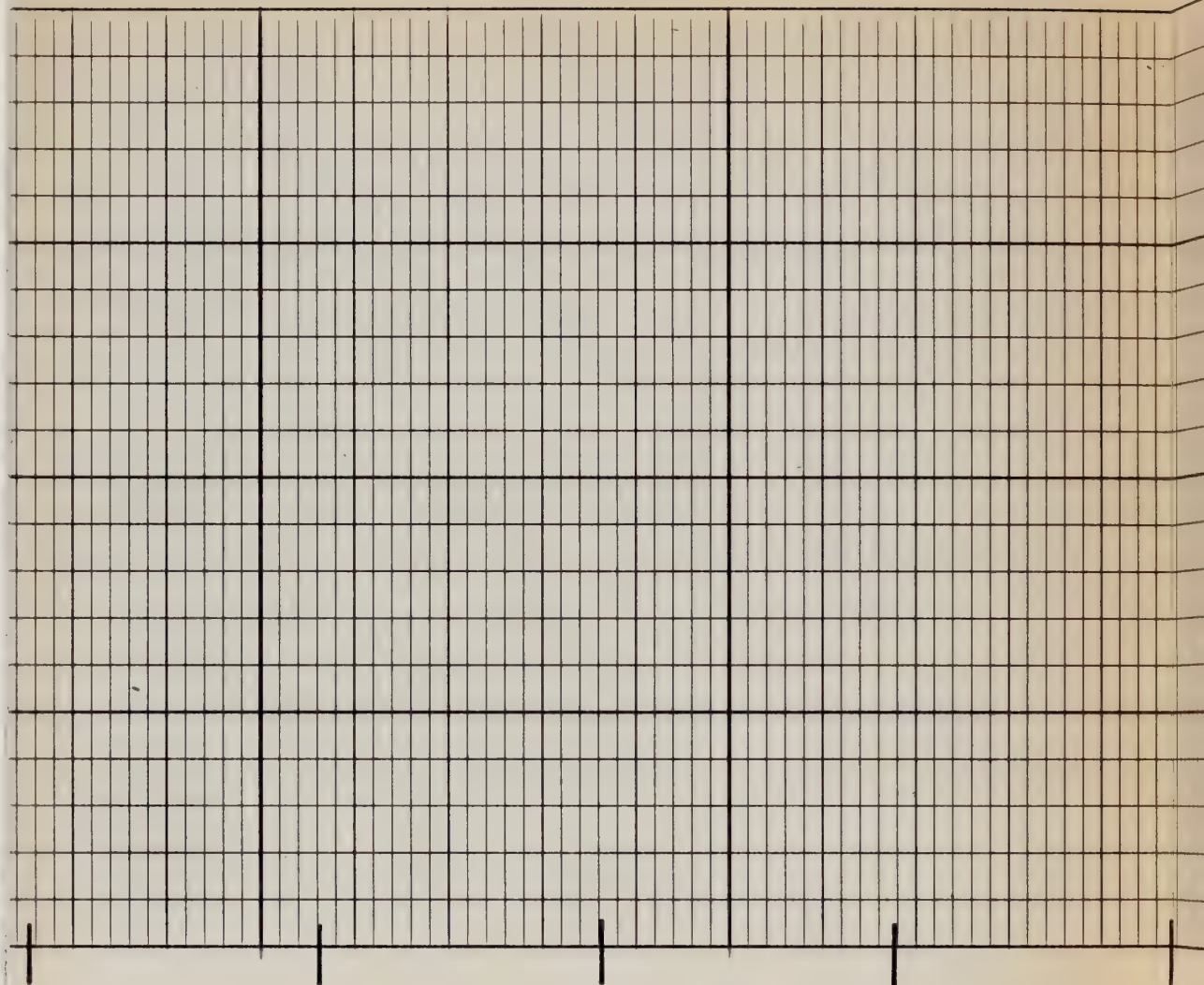
INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH
1 11/16" HYPERDOME

1600

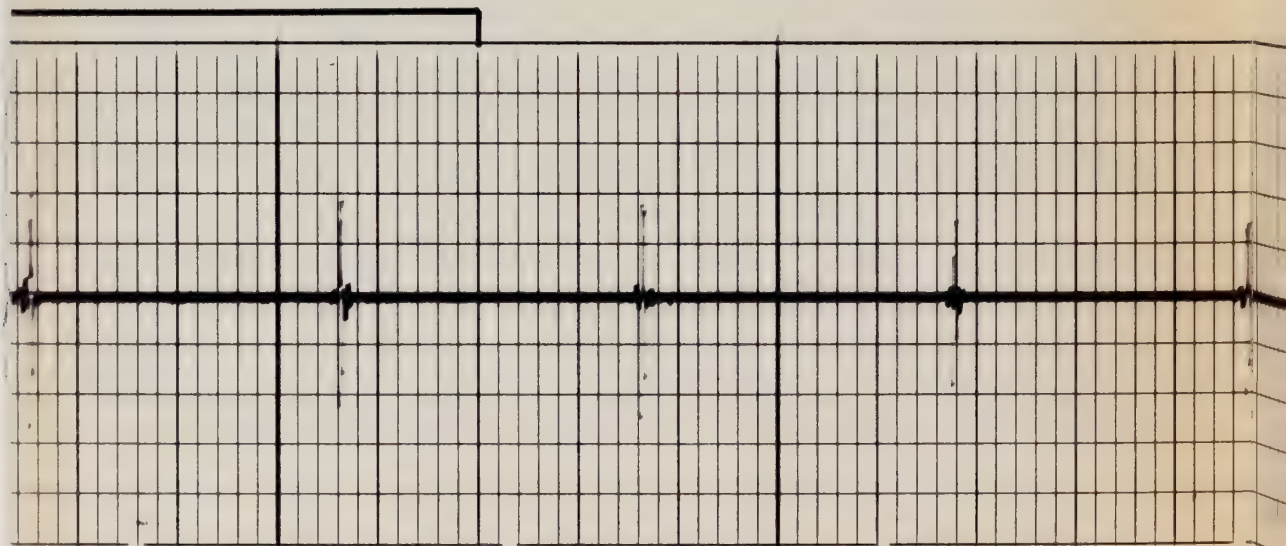
1700

INDICATED INTERVAL
PERFORATED TWO
SHOTS PER FOOT
WITH 1 11/16"
HYPERDOME

1800

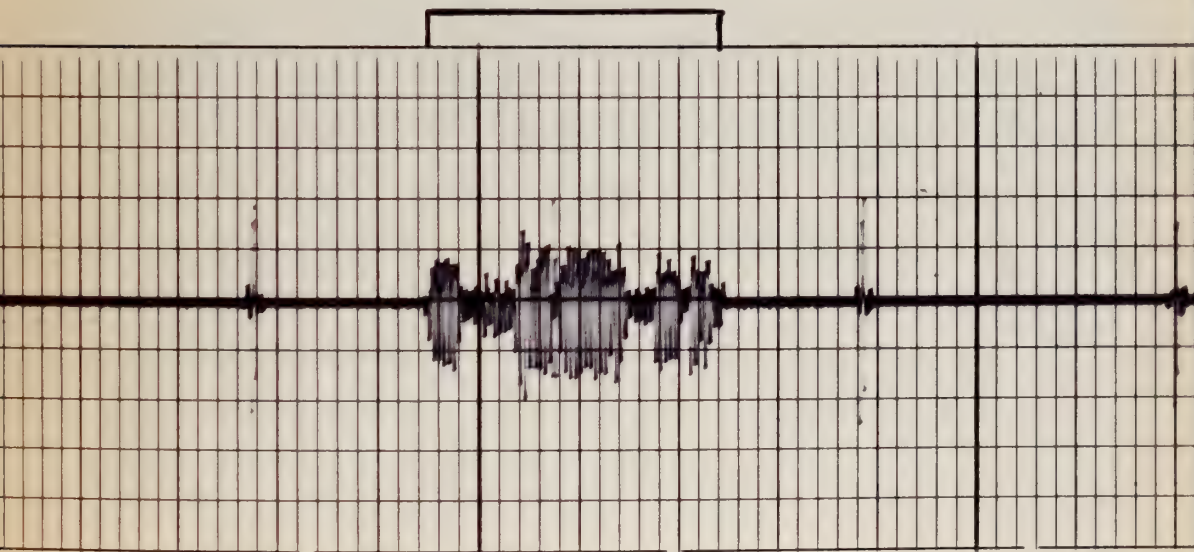


1900



INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH 1 11/16"
UNI-CERAMIC EXPENDABLE
JETS

2000



INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH 1 11/16"
UNIT-CERAMIC EXPENDABLE
JETS

2100

INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH 1 11/16"
UNIT-CERAMIC EXPENDABLE
JETS

2200

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2300

INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH 1 11/16"
UNI-CERAMIC EXPENDABLE
JETS

INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH
1 11/16" UNI-CERAMIC
EXPENDABLE JETS

INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH
1 11/16" UNI-CERAMIC
EXPENDABLE JETS

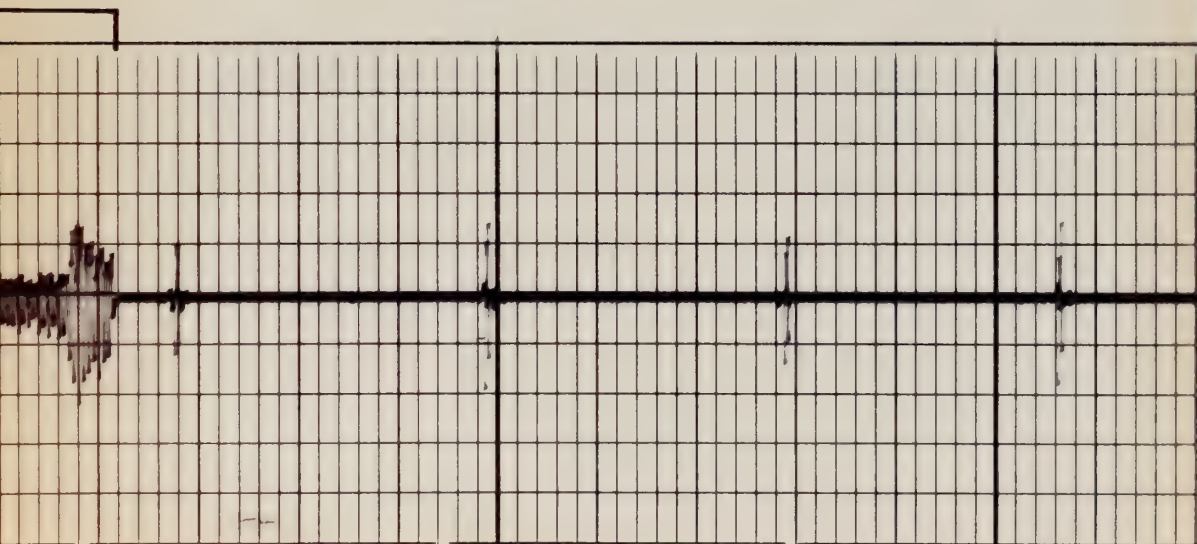
INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH
1 11/16" UNI-CERAMIC
EXPENDABLE JETS

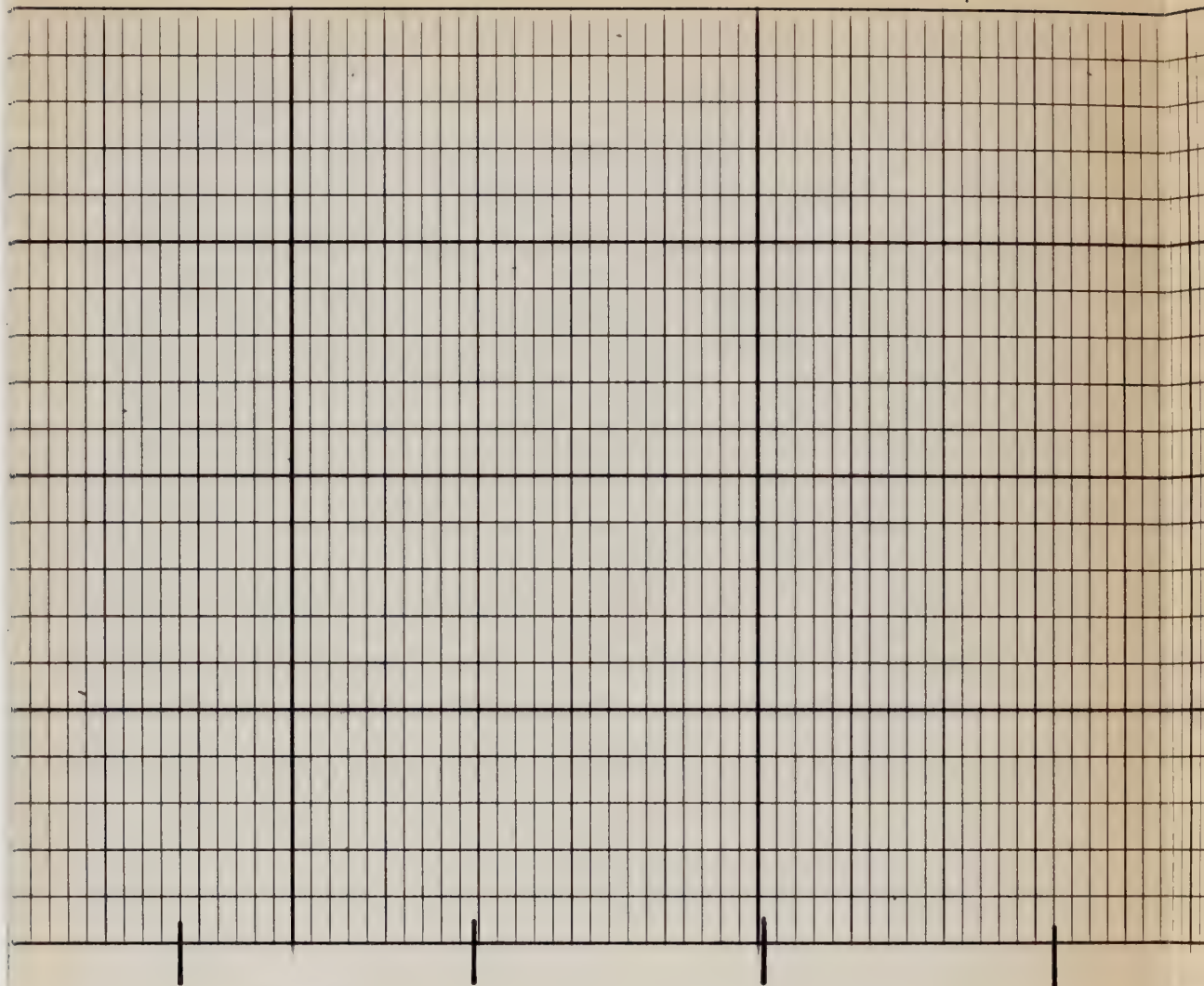
INDICATED INTERVAL
PERFORATED TWO SHOTS
PER FOOT WITH 1 11/16"
UNI-CERAMIC EXPENDABLE

2400

UNI-CERAMIC EXPENDABLE
JETS

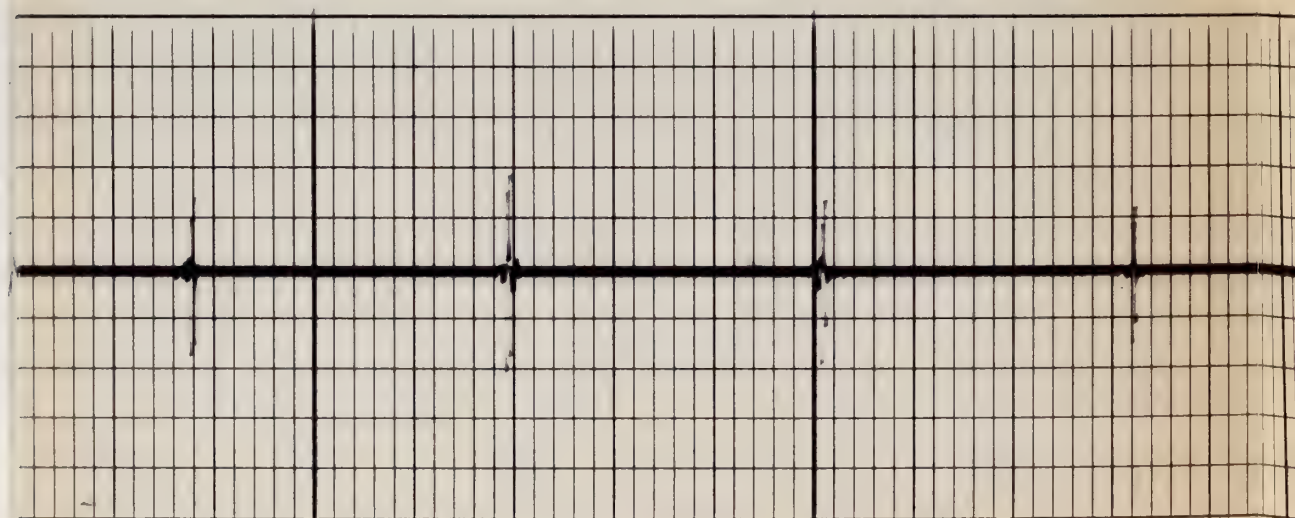
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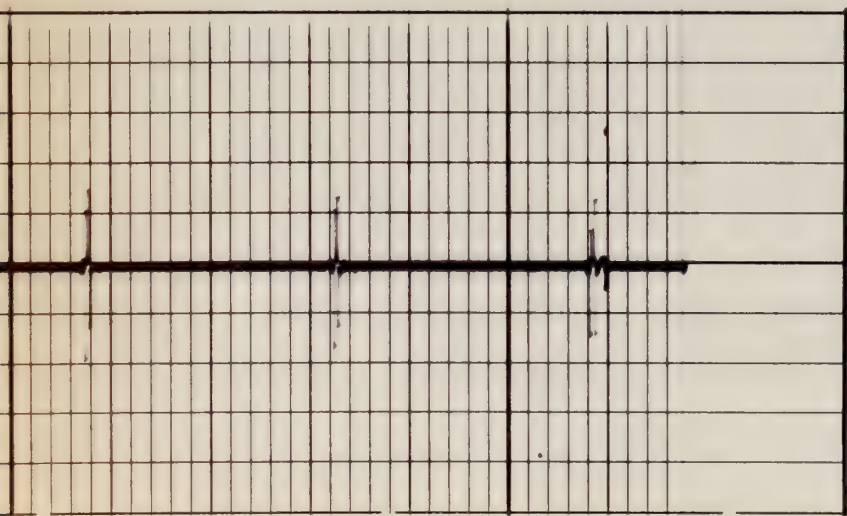
2600

2700



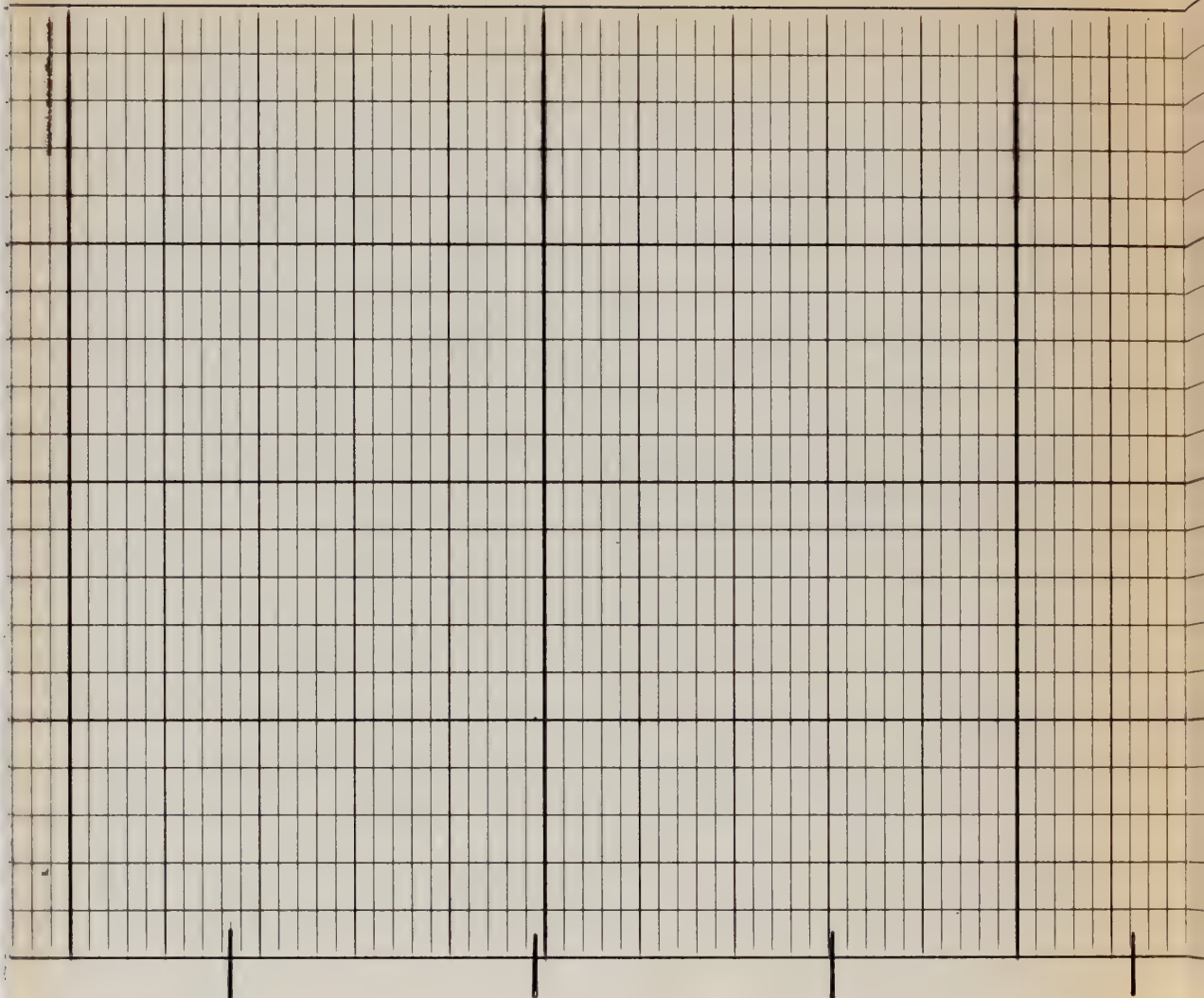


700



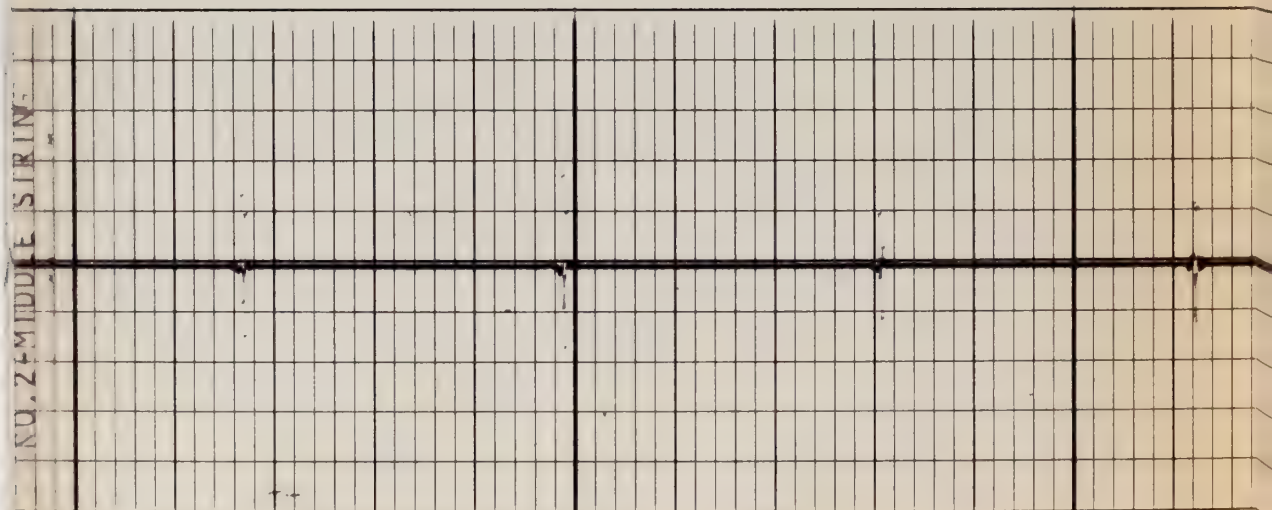
DEPTHS

CASING COLLAR LOG
BEFORE PERFORATION

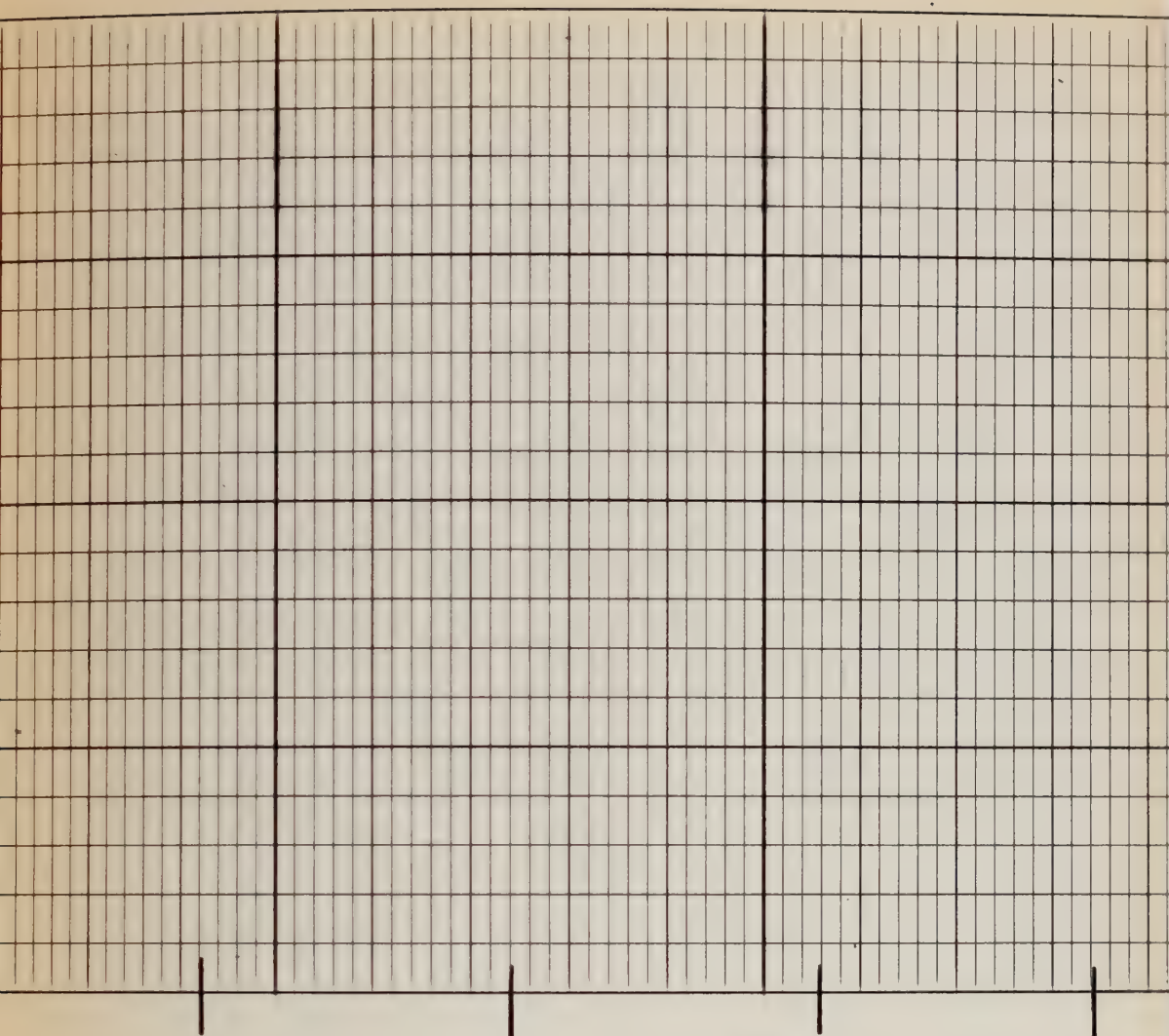


0900

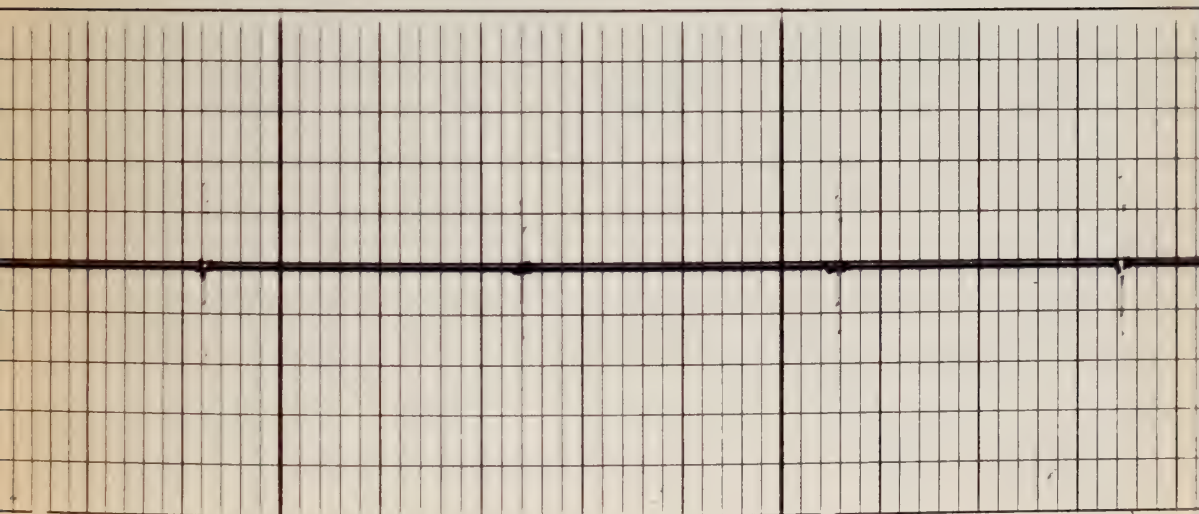
1000

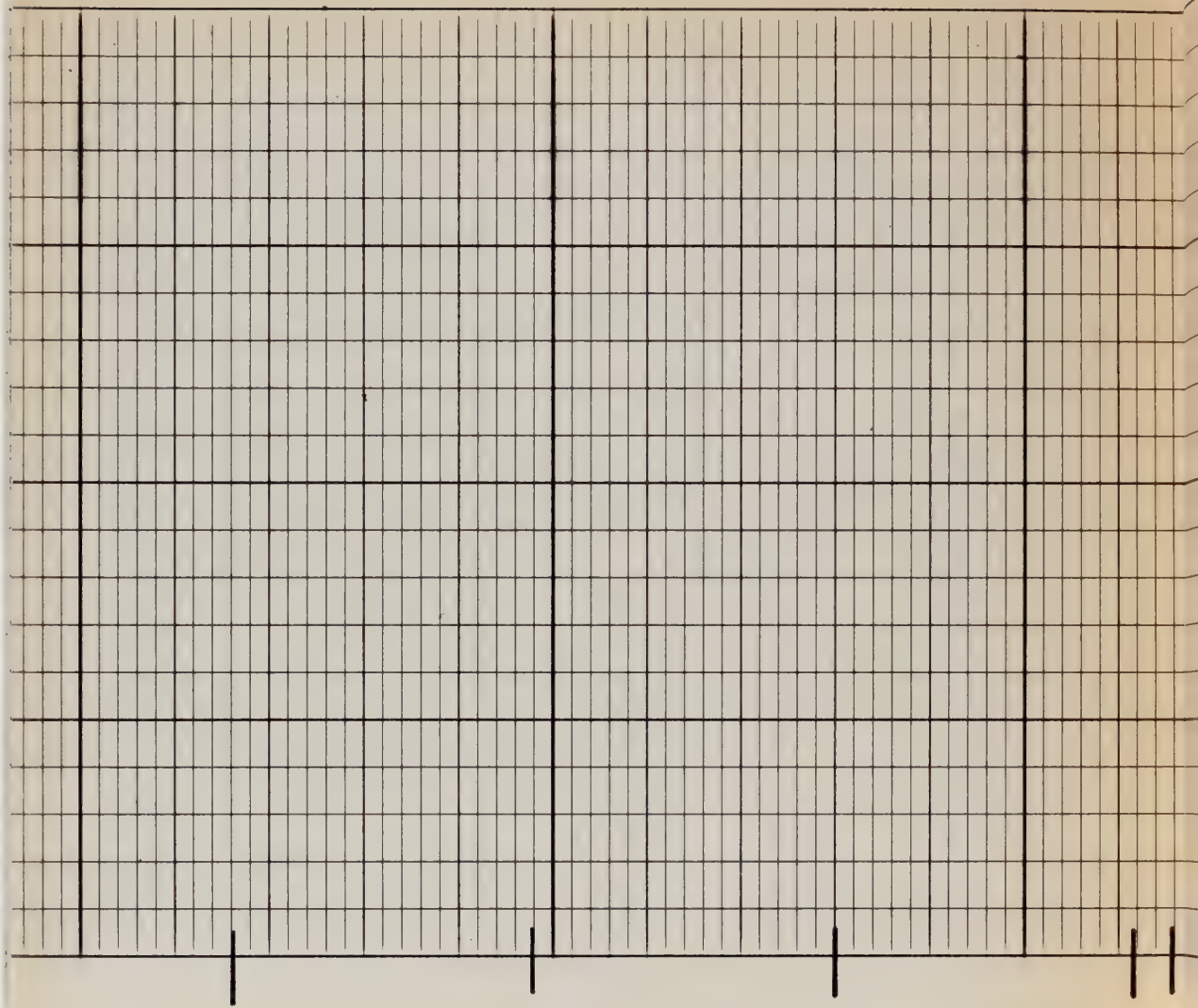


NO. 2 MIDDLE STRIP

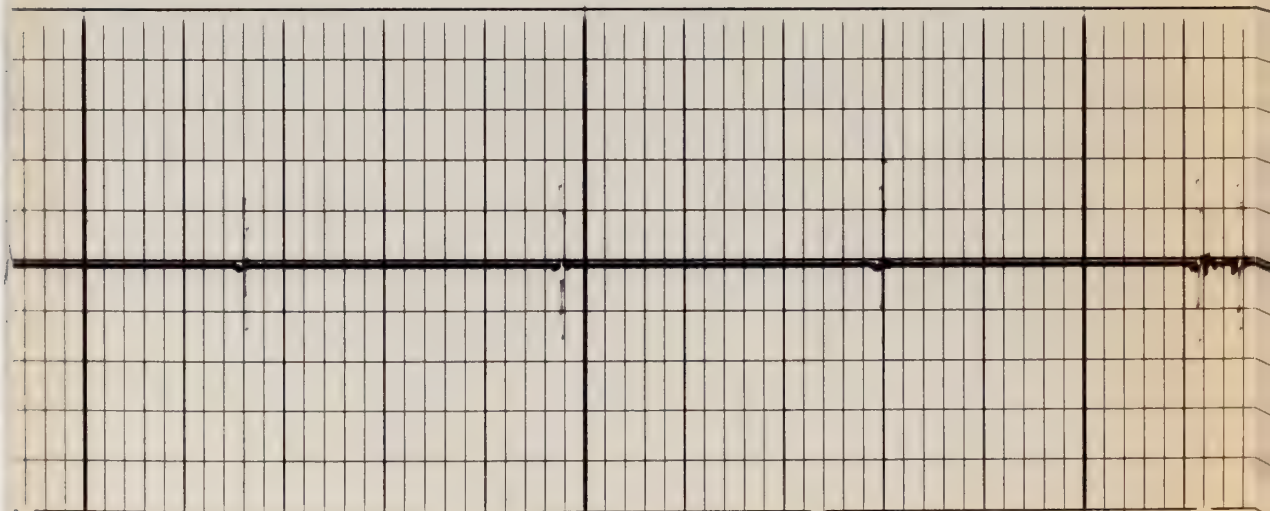


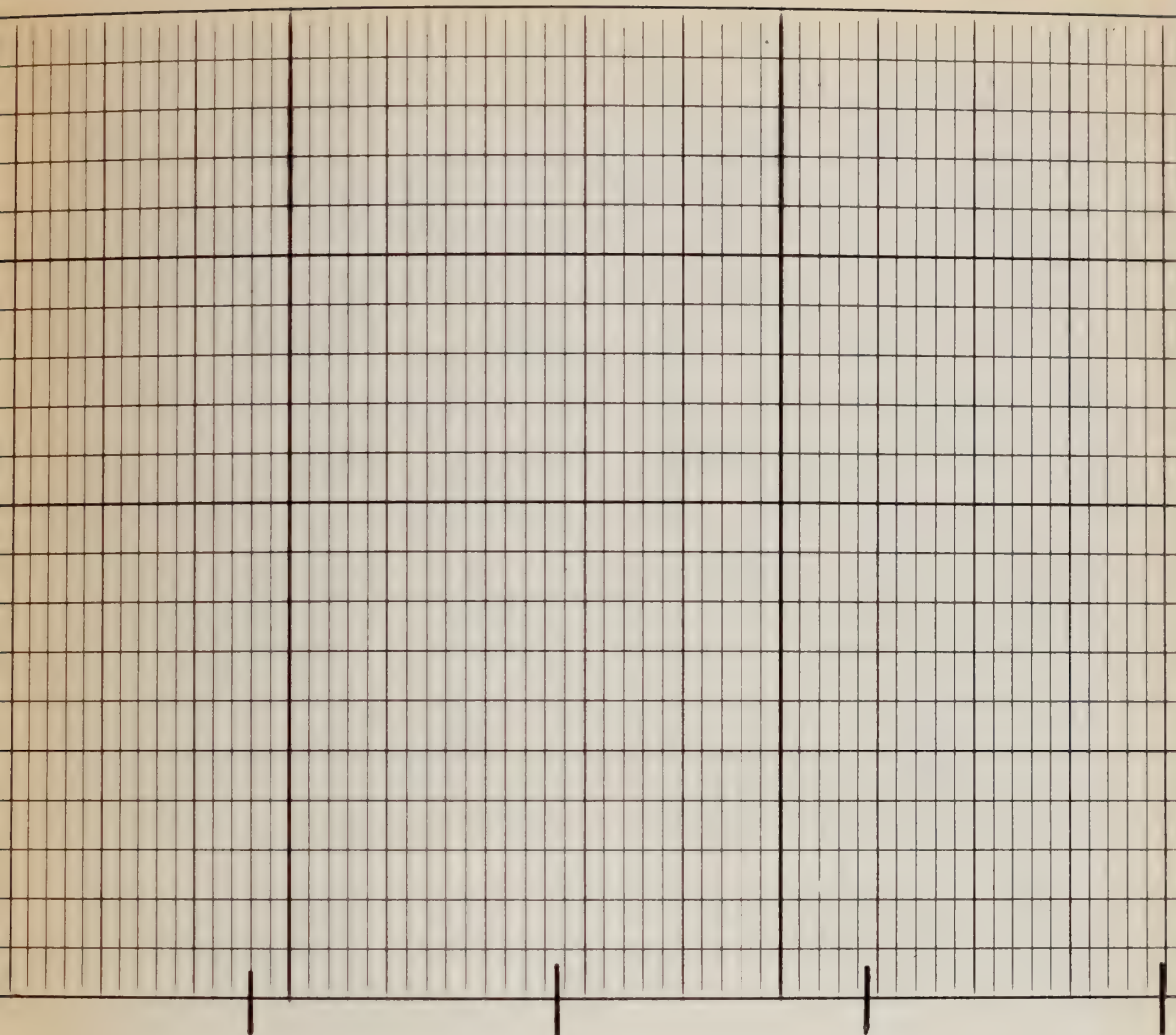
1100



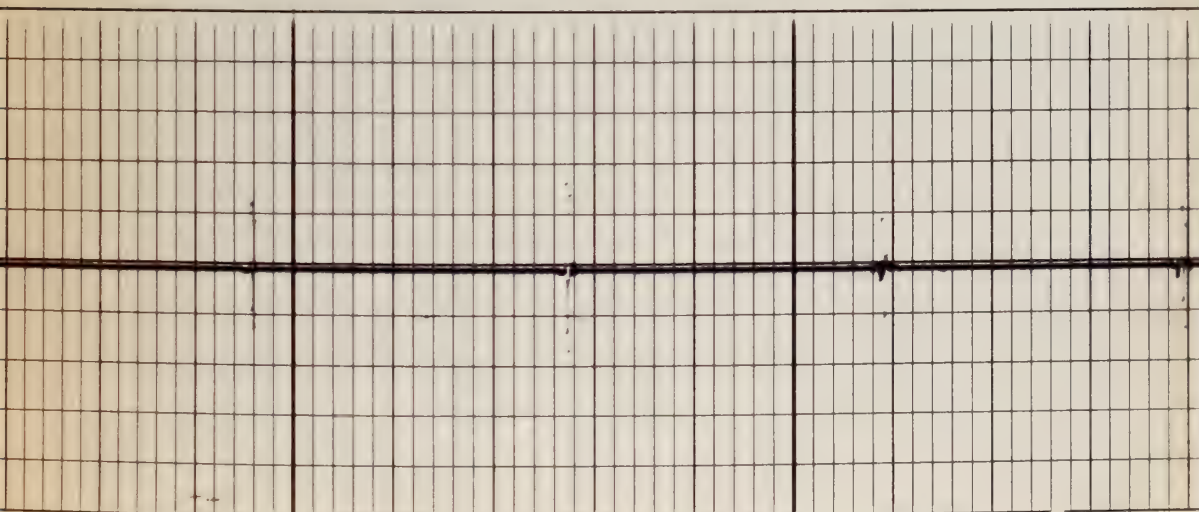


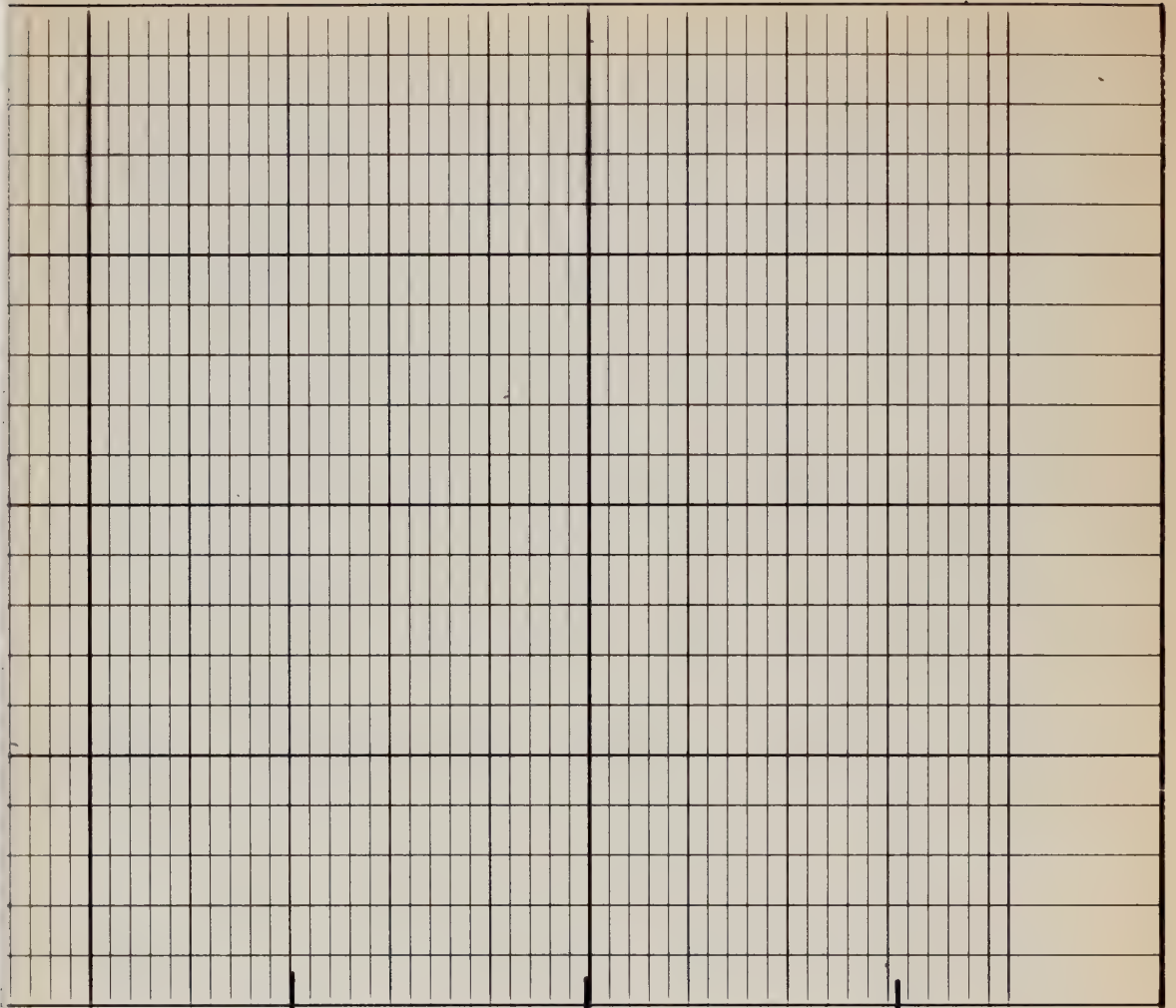
1200



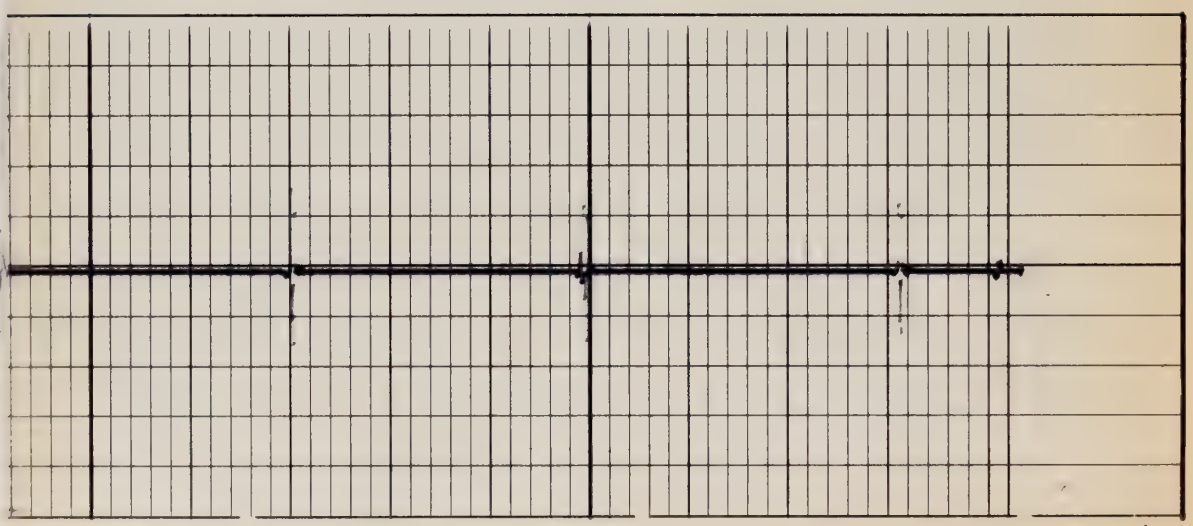


300



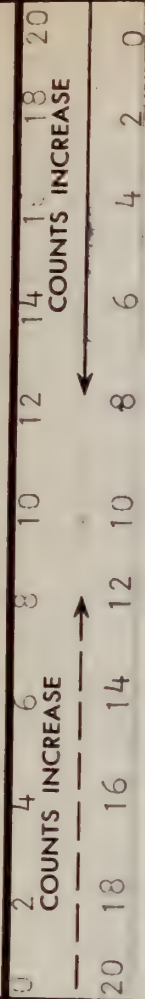


1400



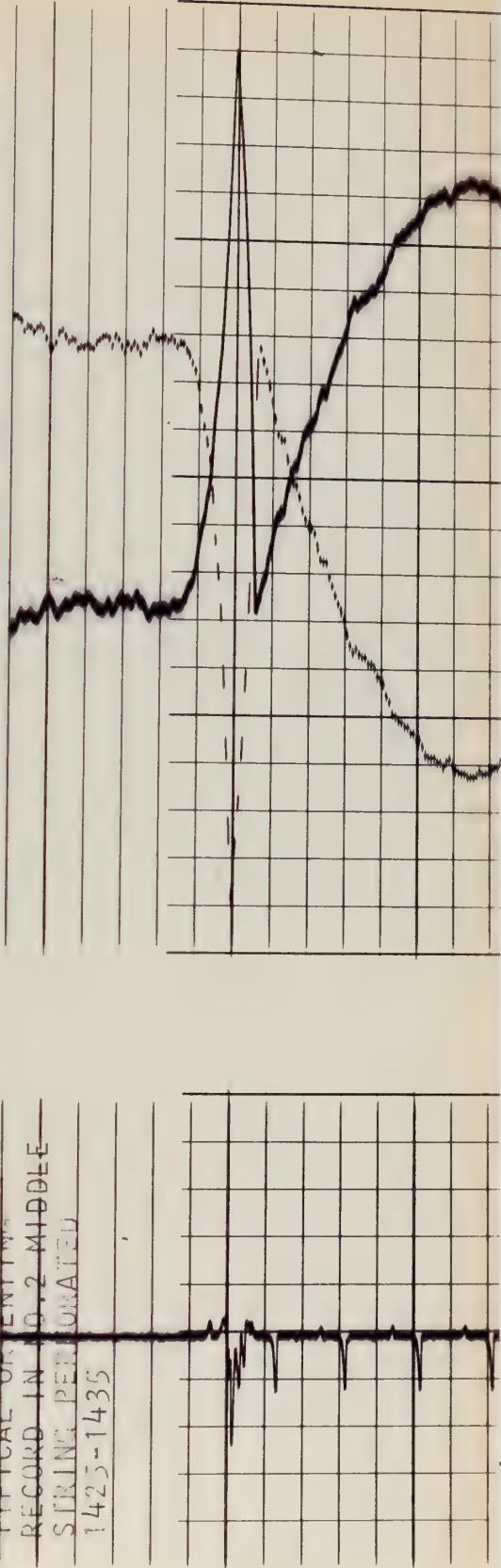
INDEXING RECORD

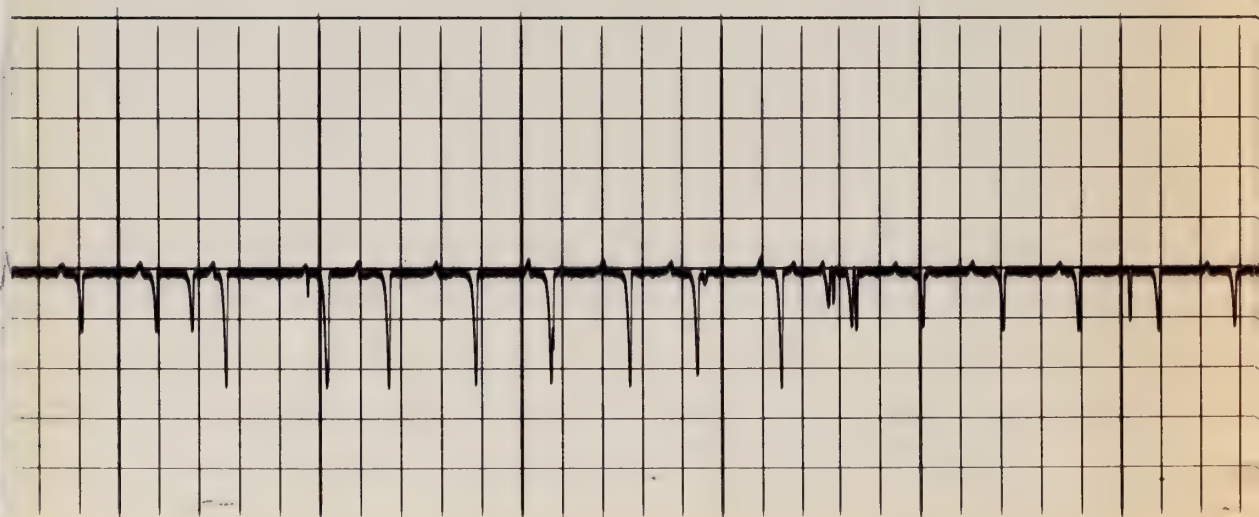
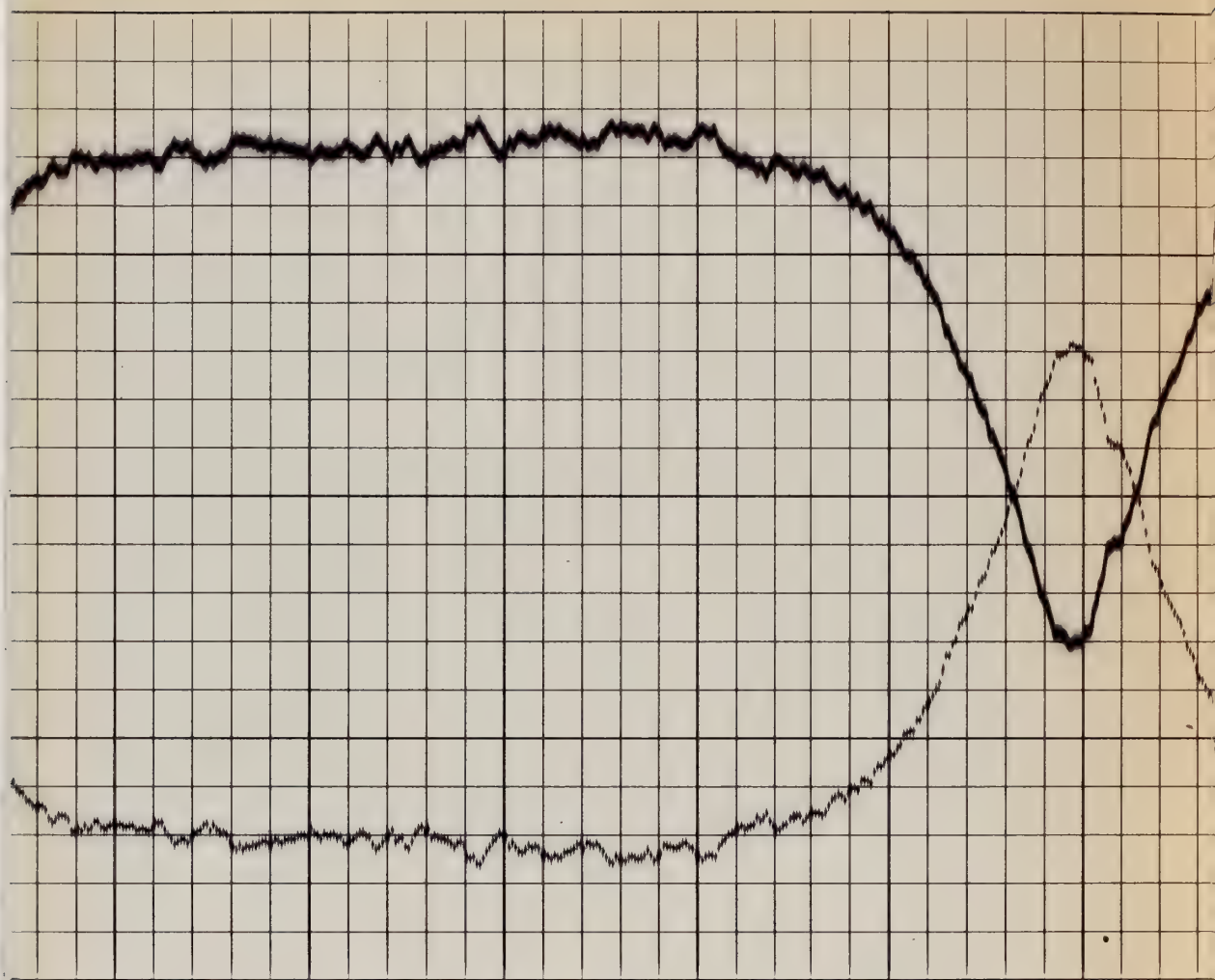
RADIO-ORIENTATION RECORD

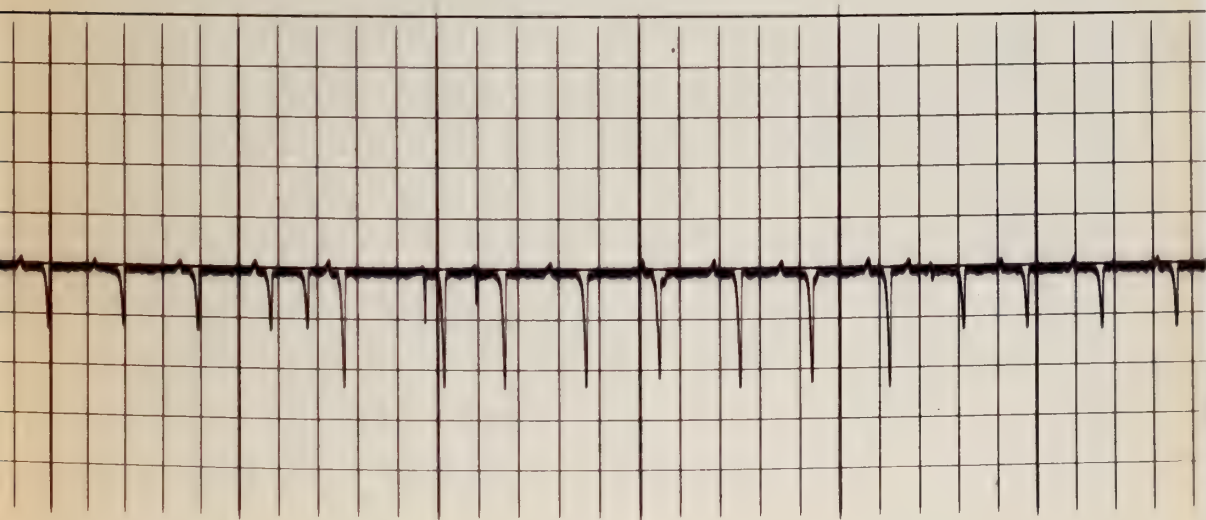
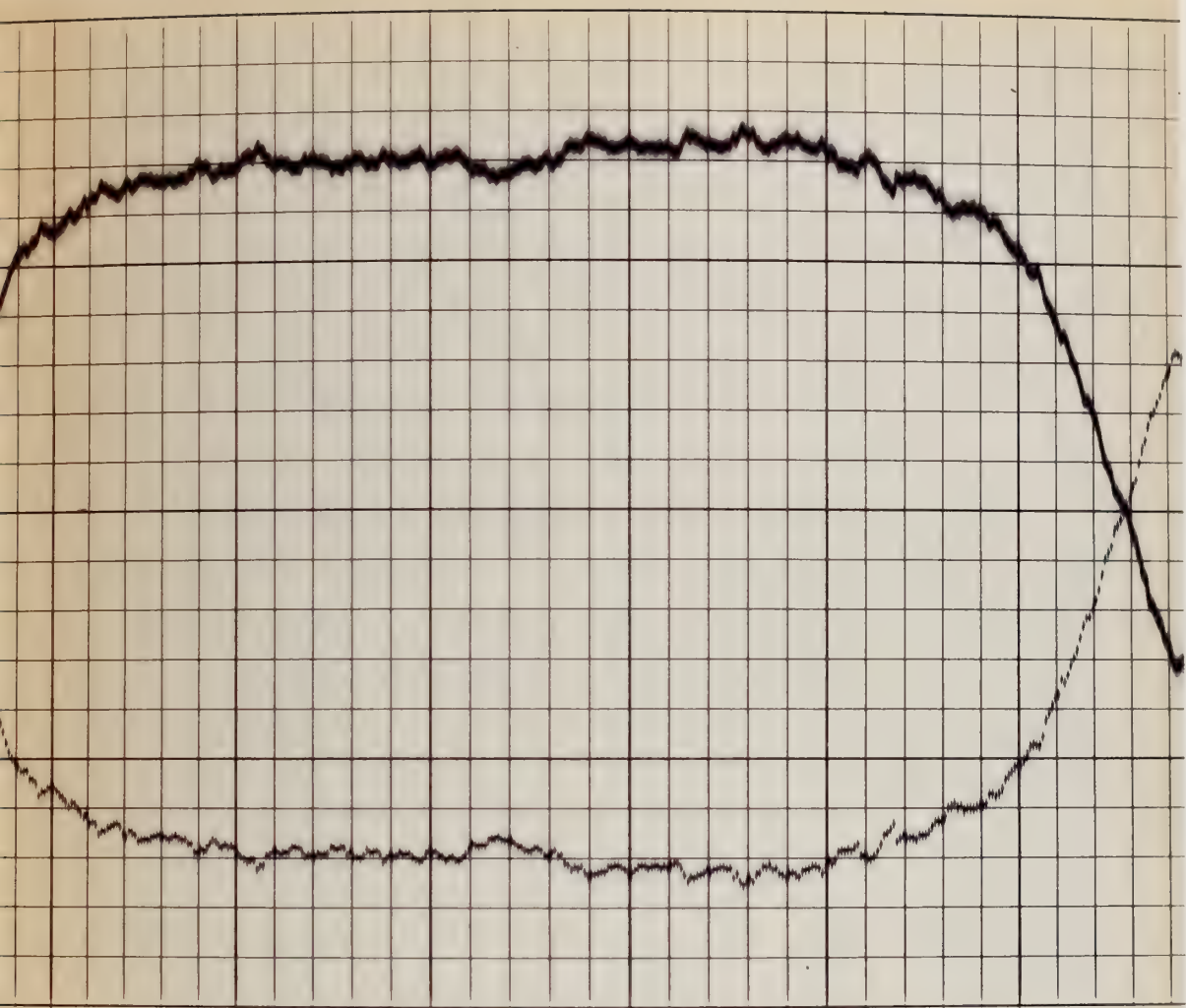


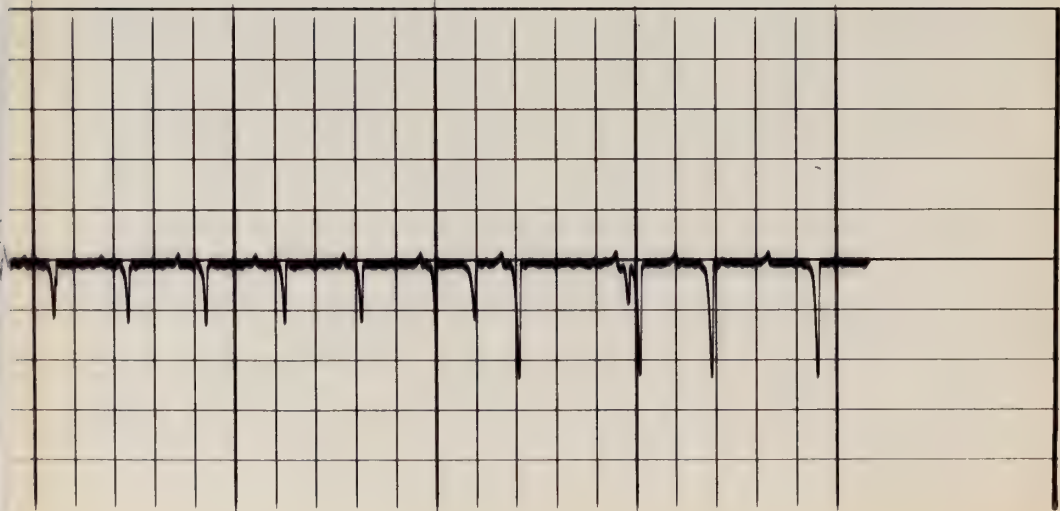
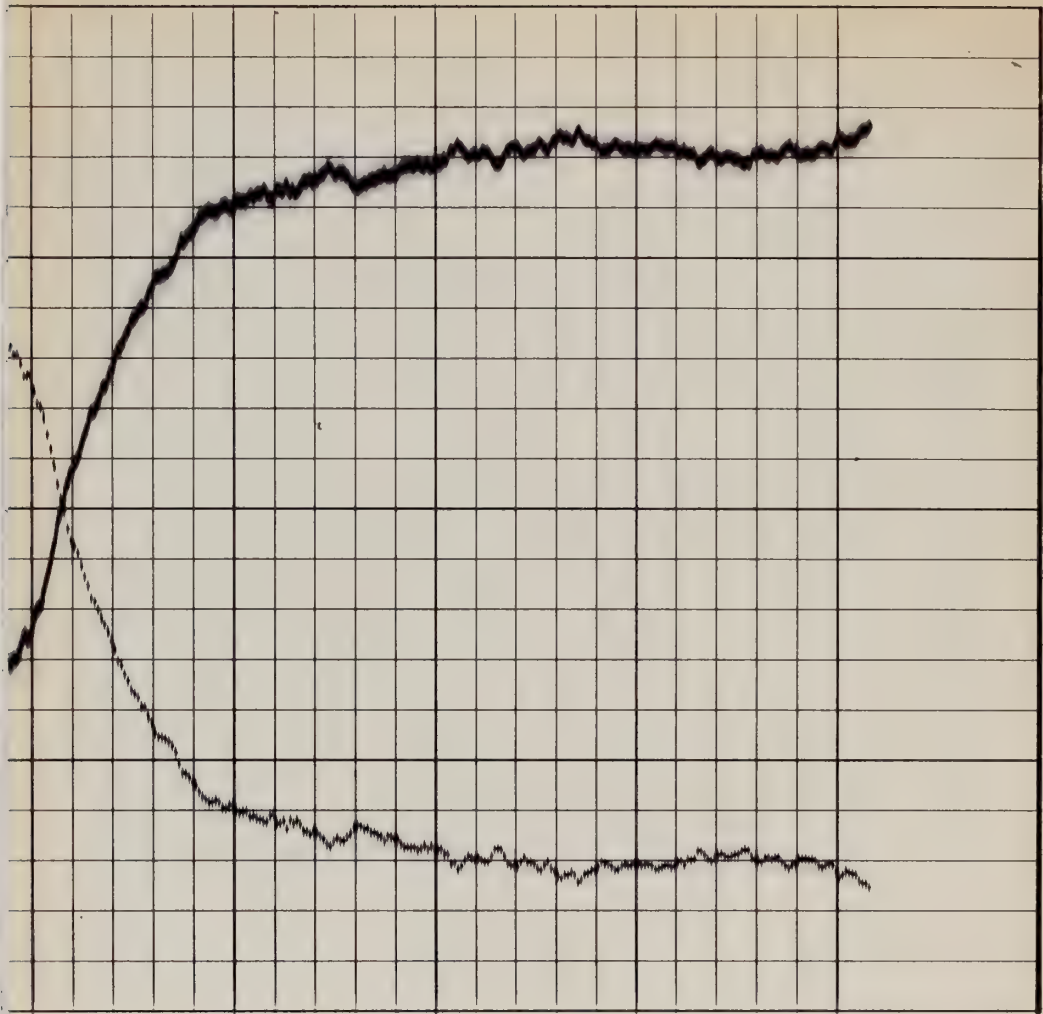
TYPICAL ORIENTING RECORD IN NO.2 MIDDLE STRING

TYPICAL ORIENTING
RECORD IN NO.2 MIDDLE
STRING PERFORATED
1425-1435





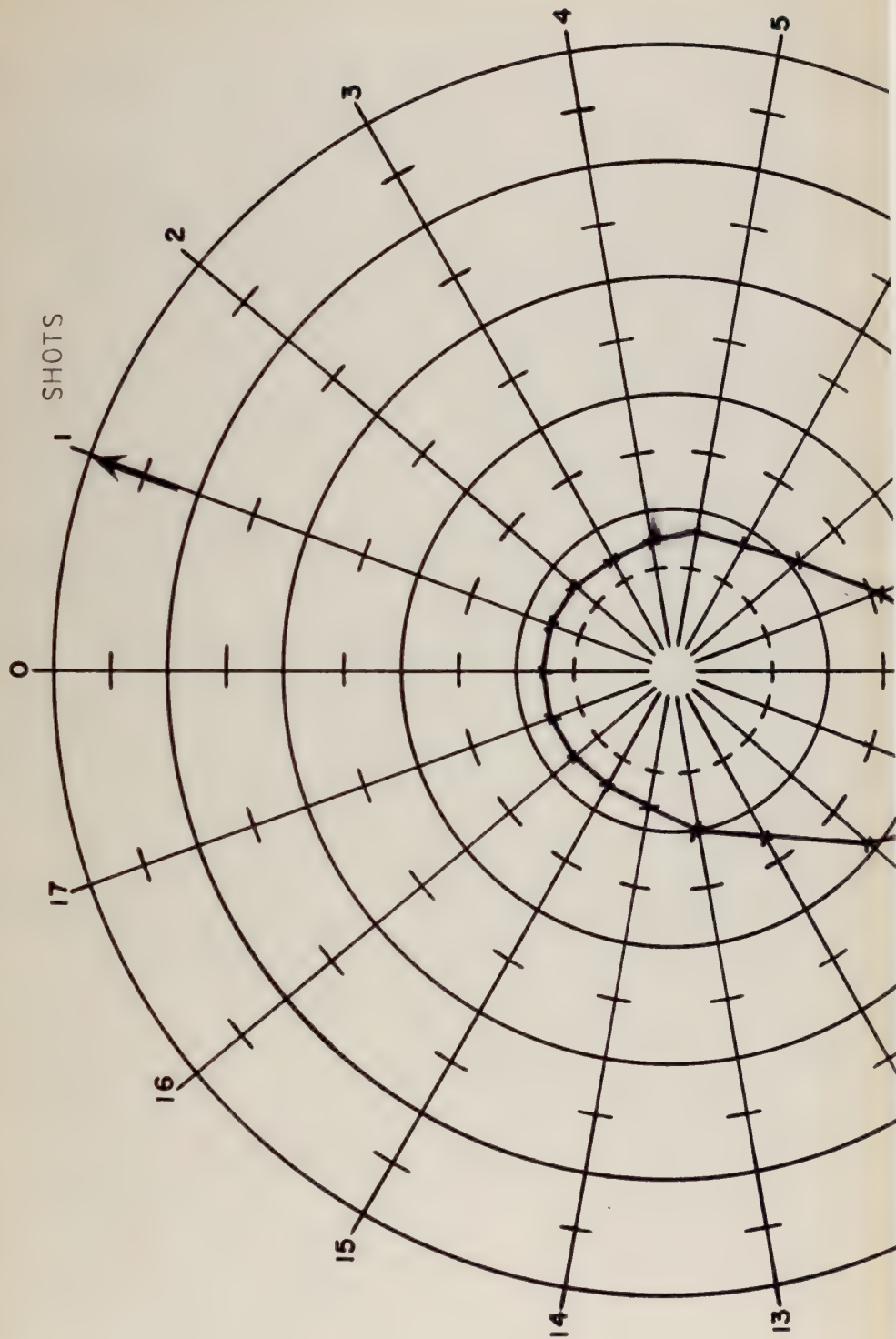


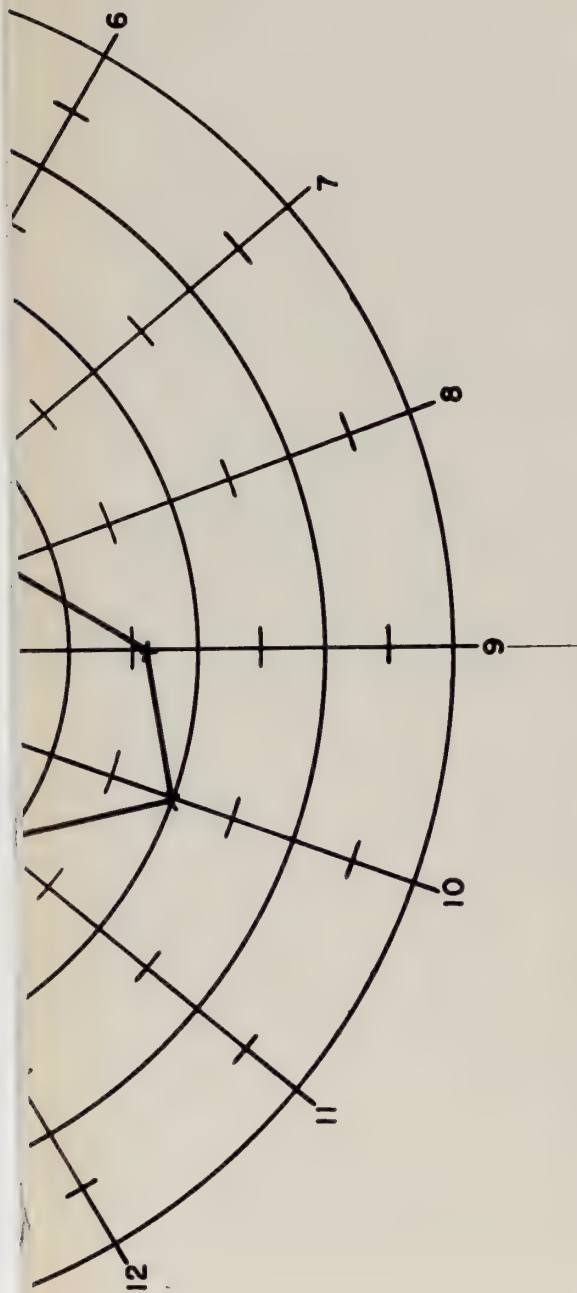


RADIO-ORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1425-1435 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

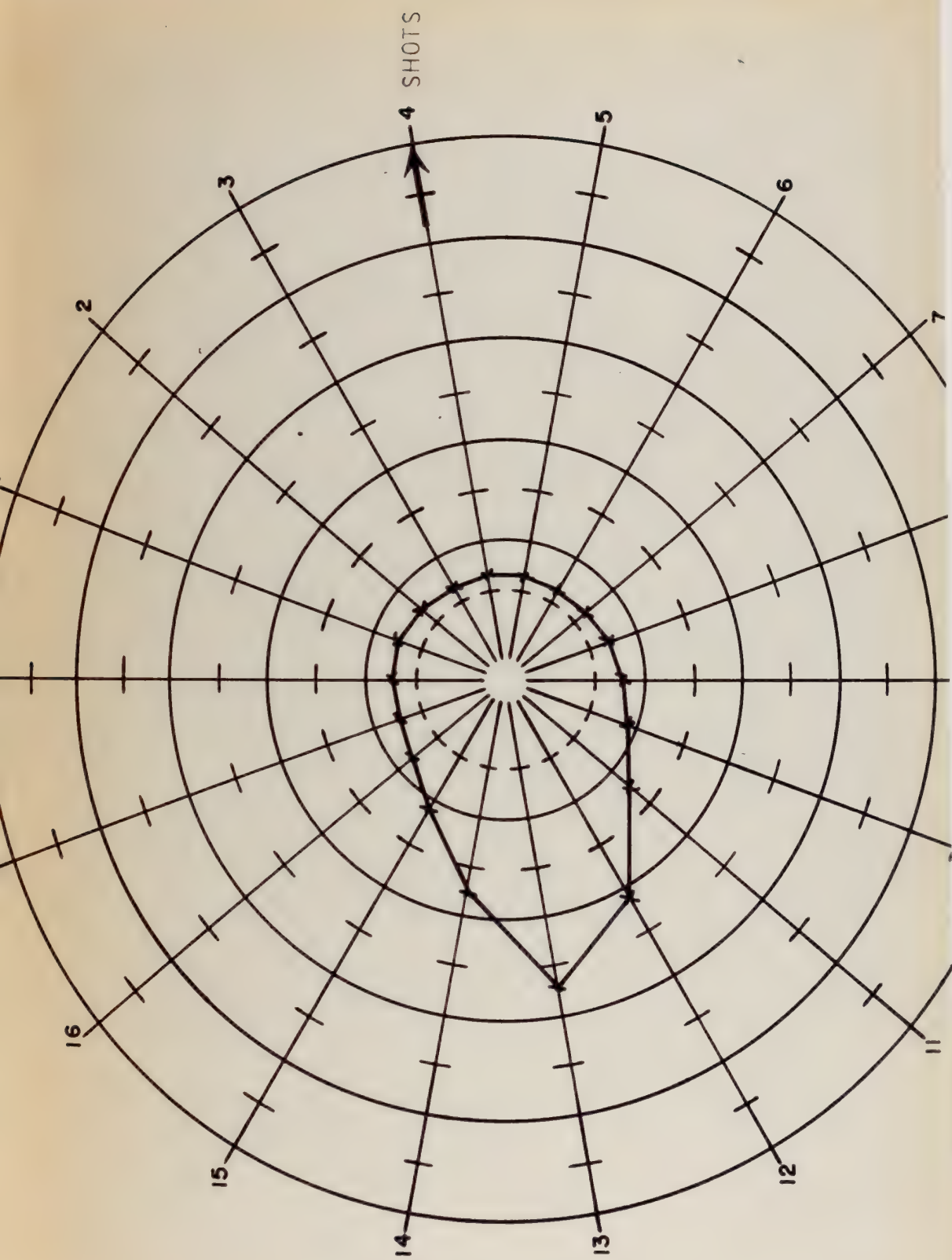
Schlumberger

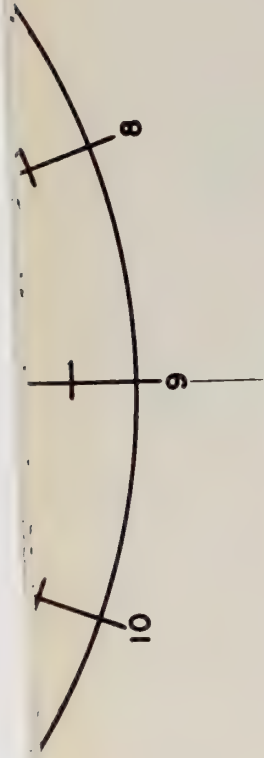
RADIOORIENTATION PLOT

POT-B

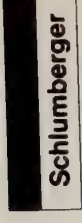
NO. 2 MIDDLE STRING PERFORATED 1414-1424 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





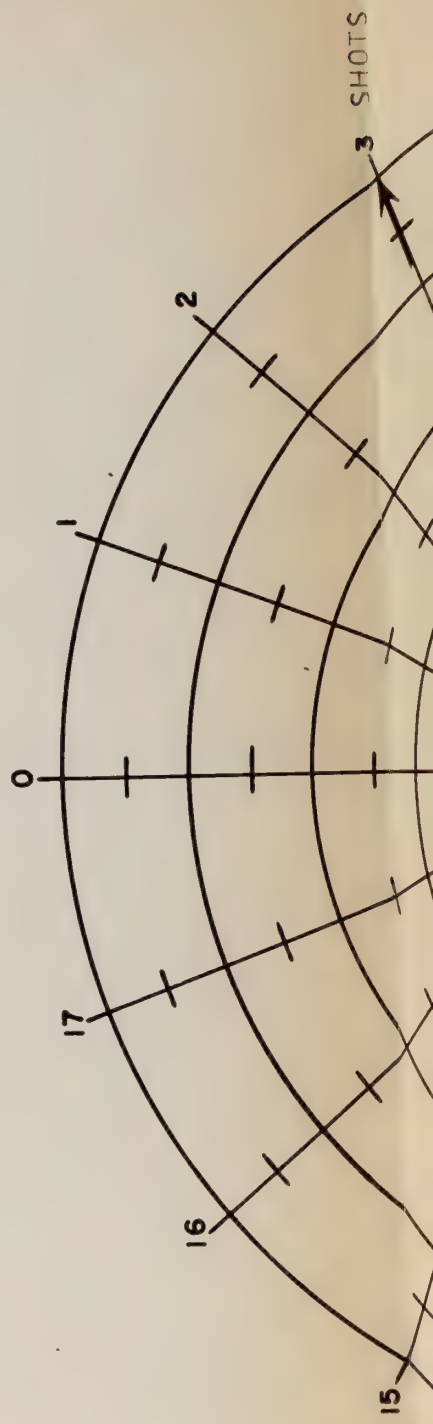


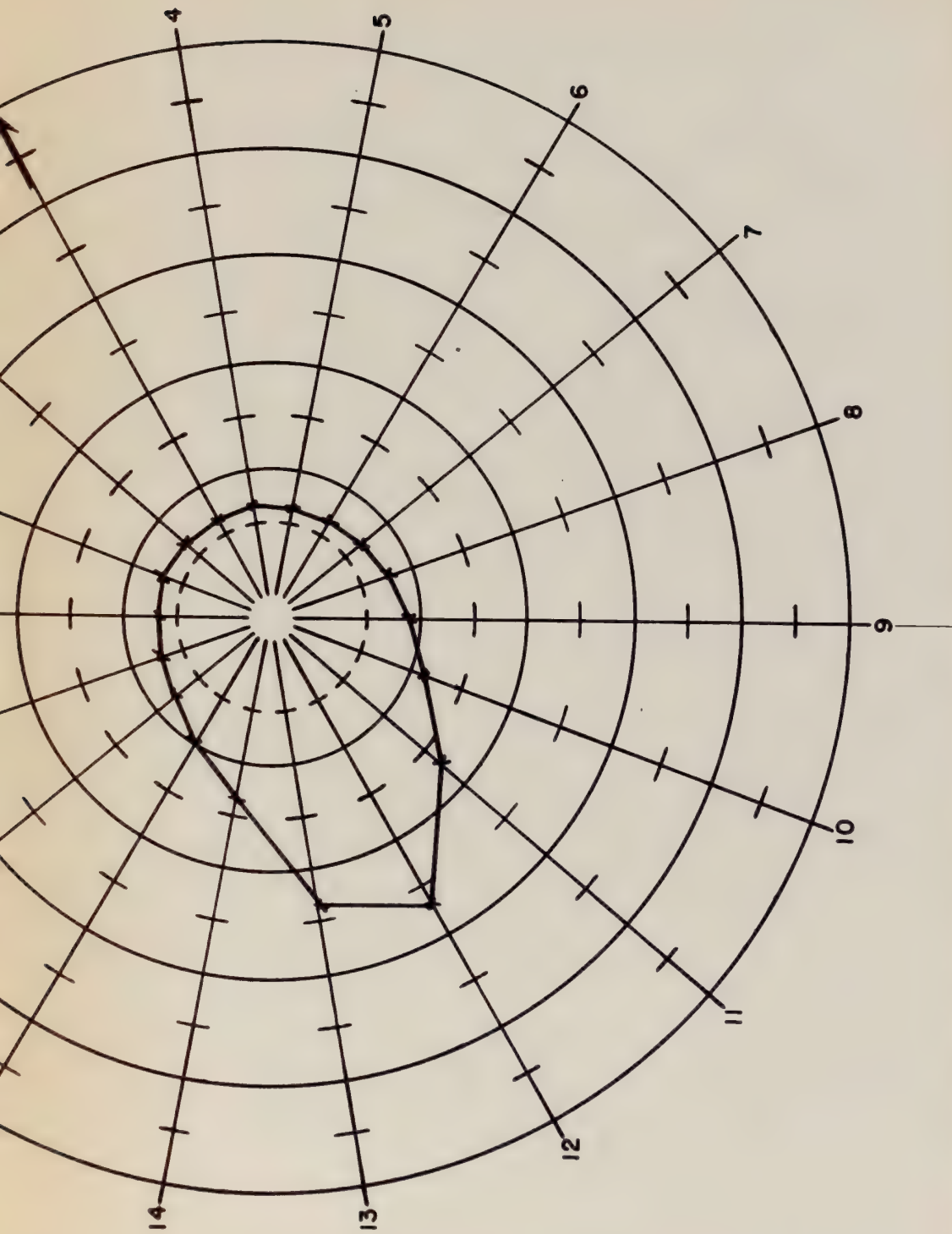
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.



RADIO-ORIENTATION PLOT

NO. 2-MIDDLE STRING PERFORATED 1403-1413 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME
 POT-B



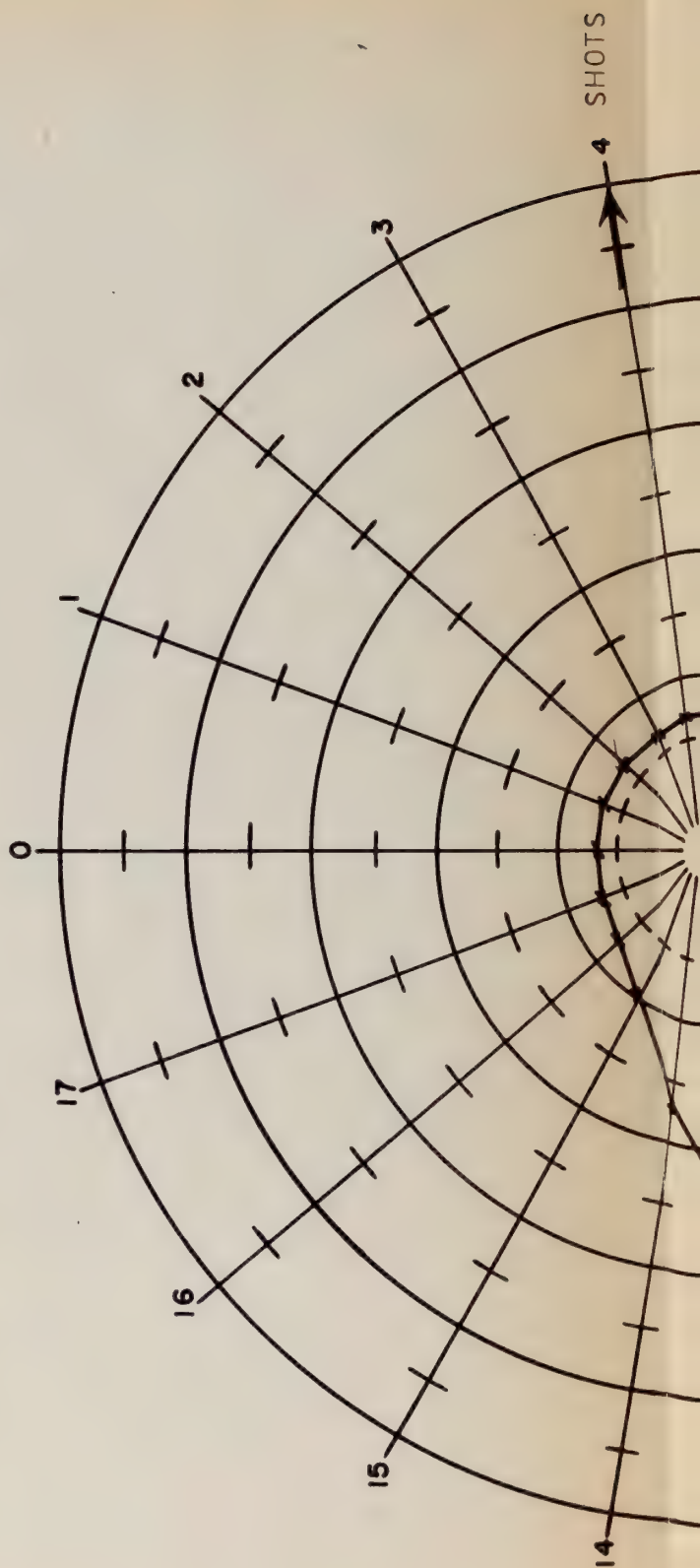


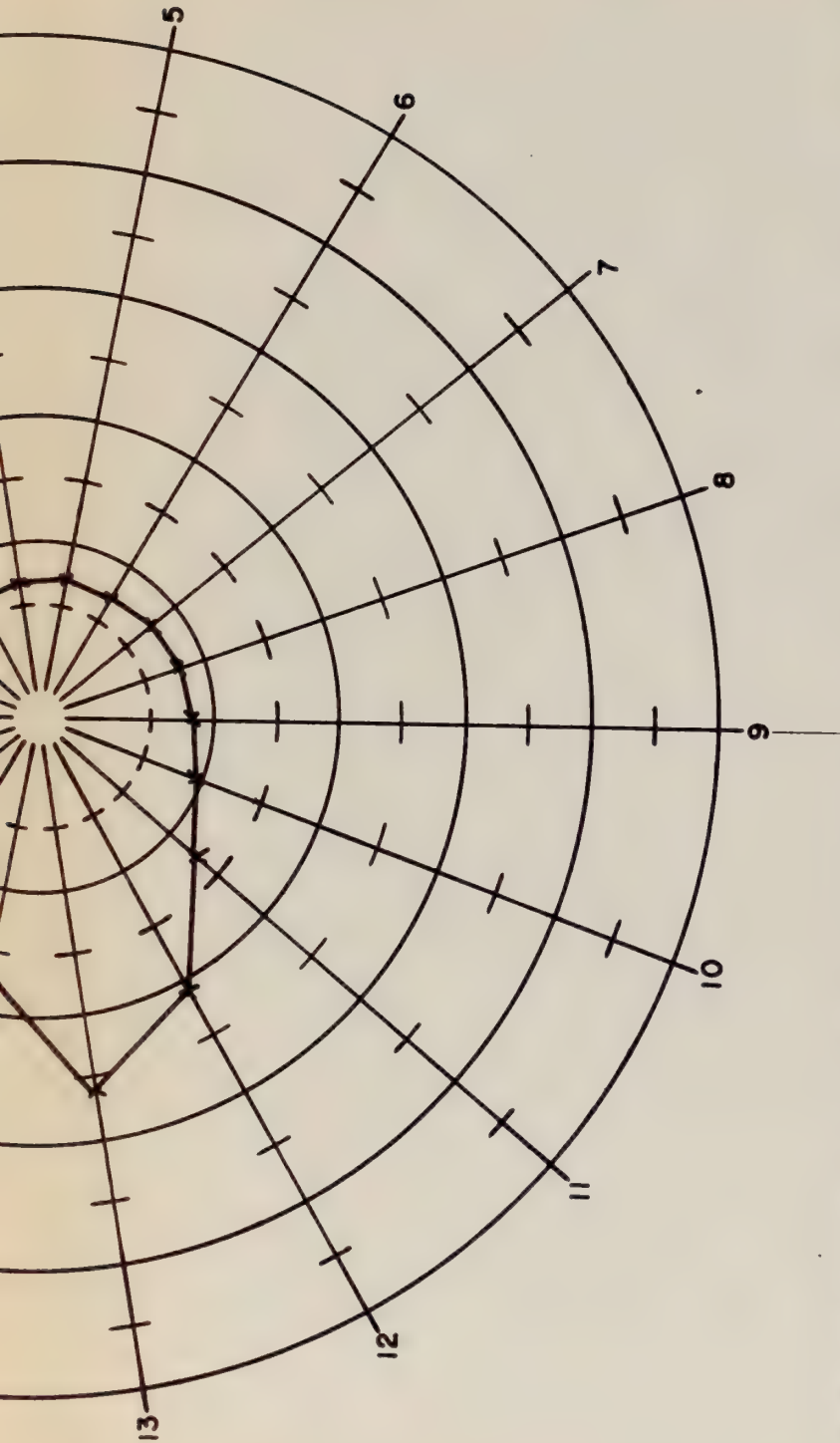
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse

side of our service order for this job, the readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

AC.2 MIDDLE STRING PERFORATED 1393-1492 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME
 POT-B





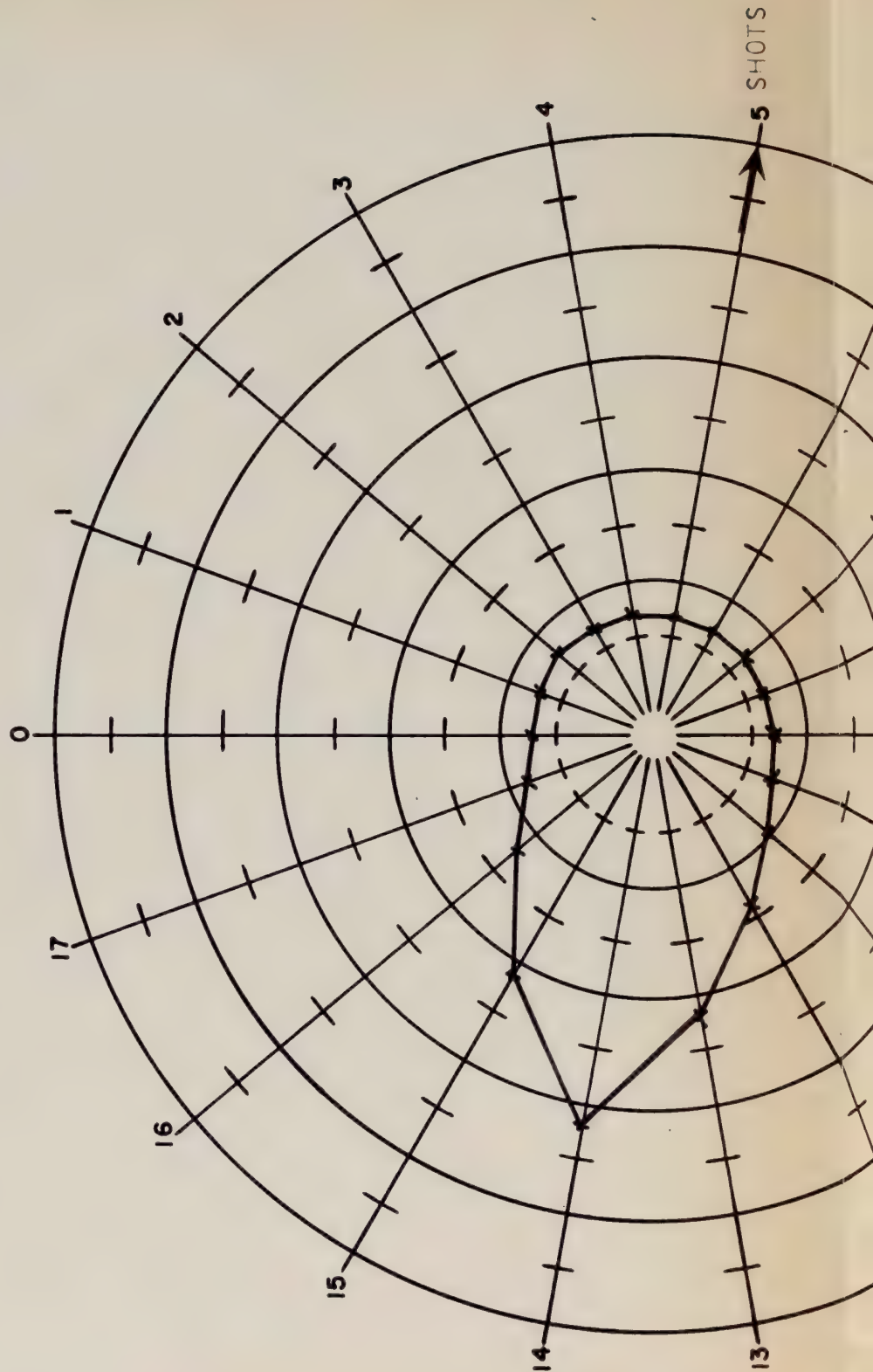
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

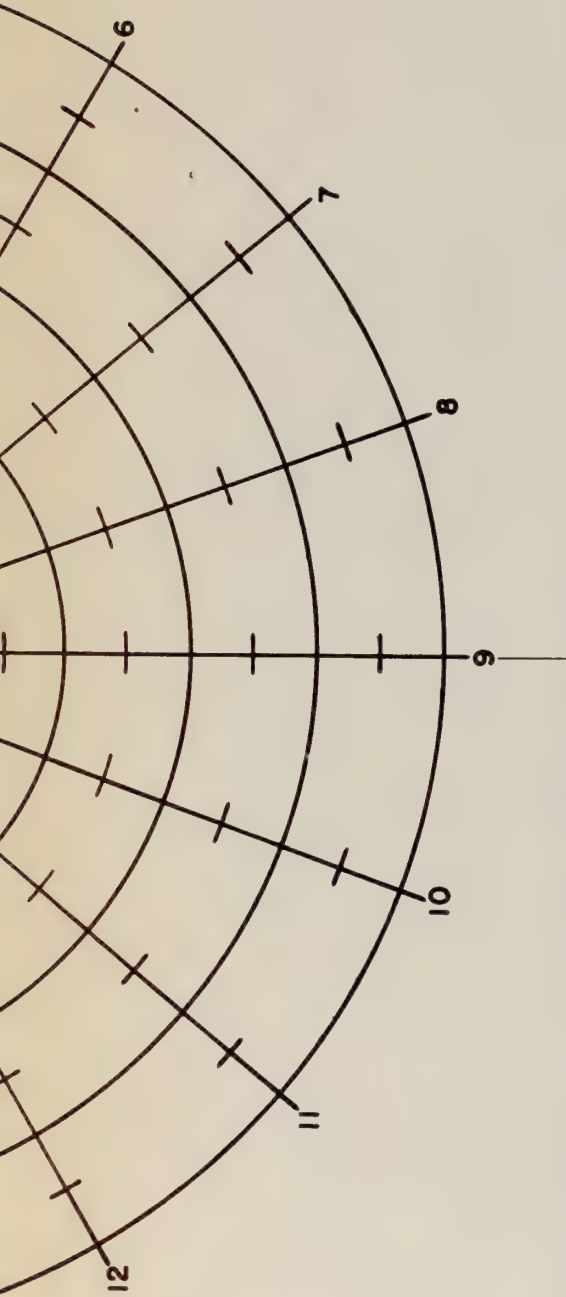
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO.2-MIDDLE STRING PERFORATED 1385-1392 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



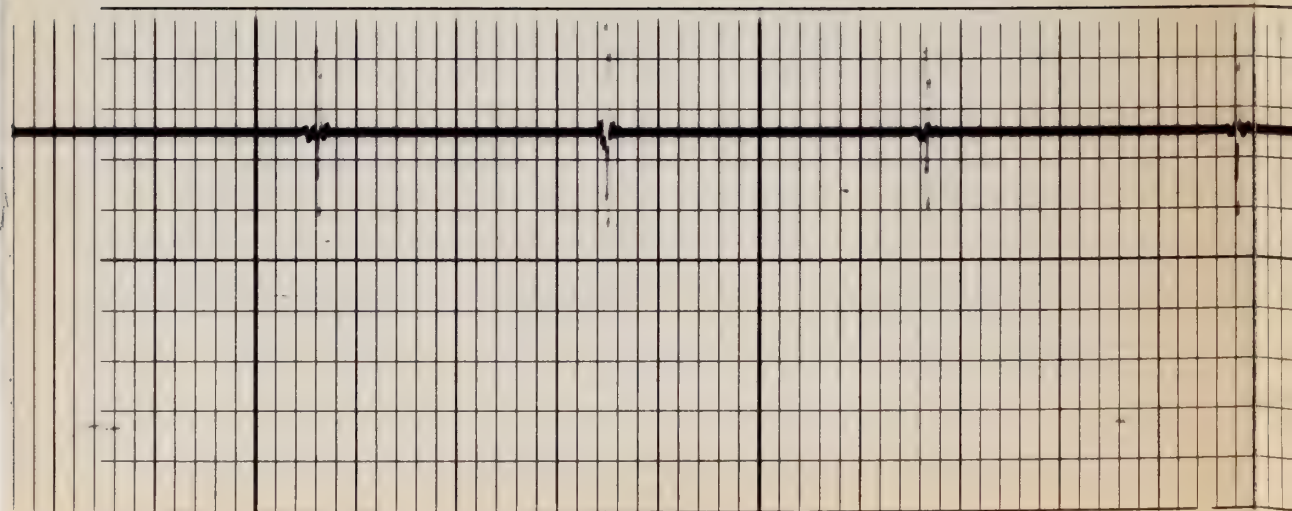
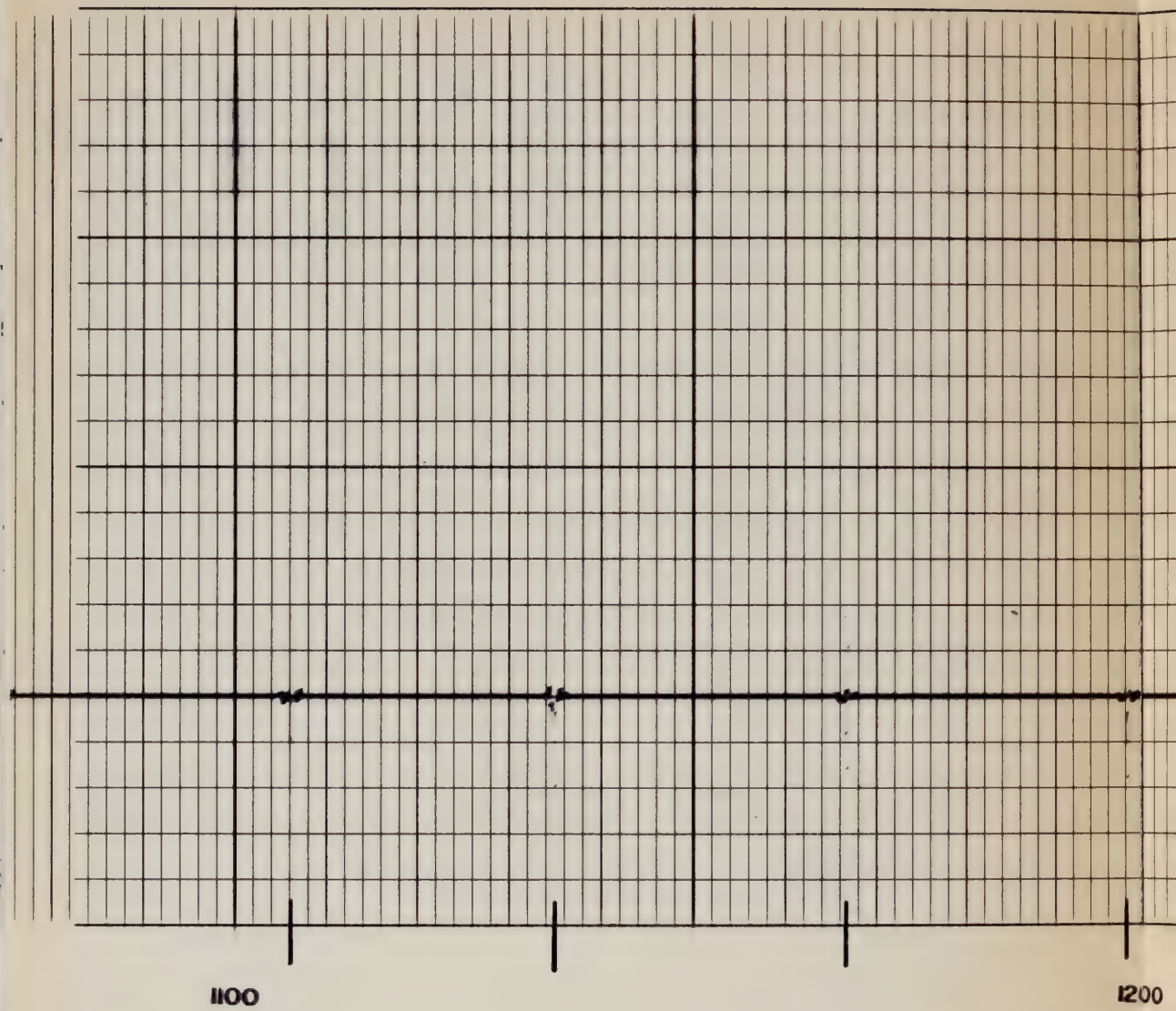


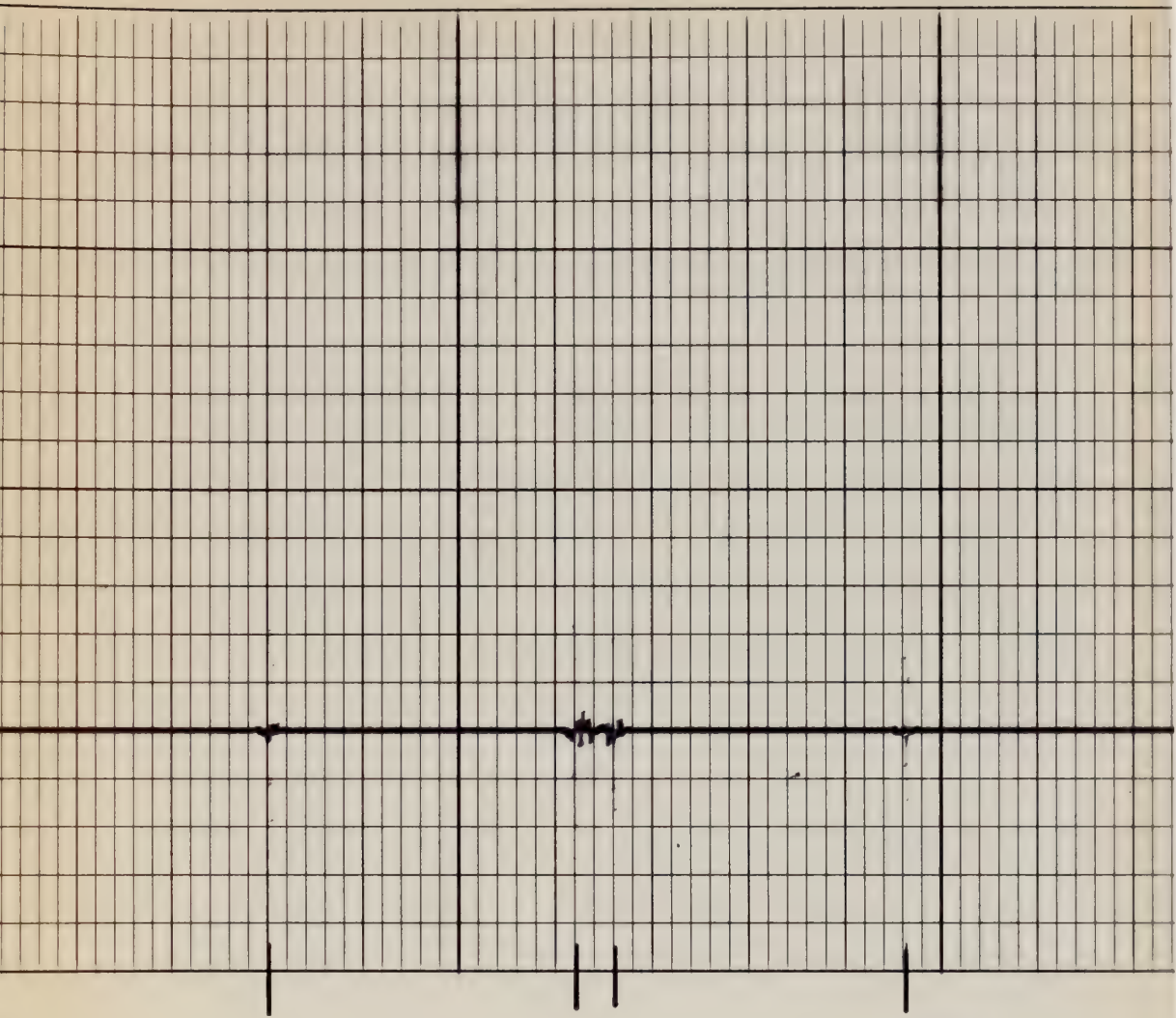
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

COLLAR LOG RUN AFTER PERFORATING
NO.2-MIDDLE STRING

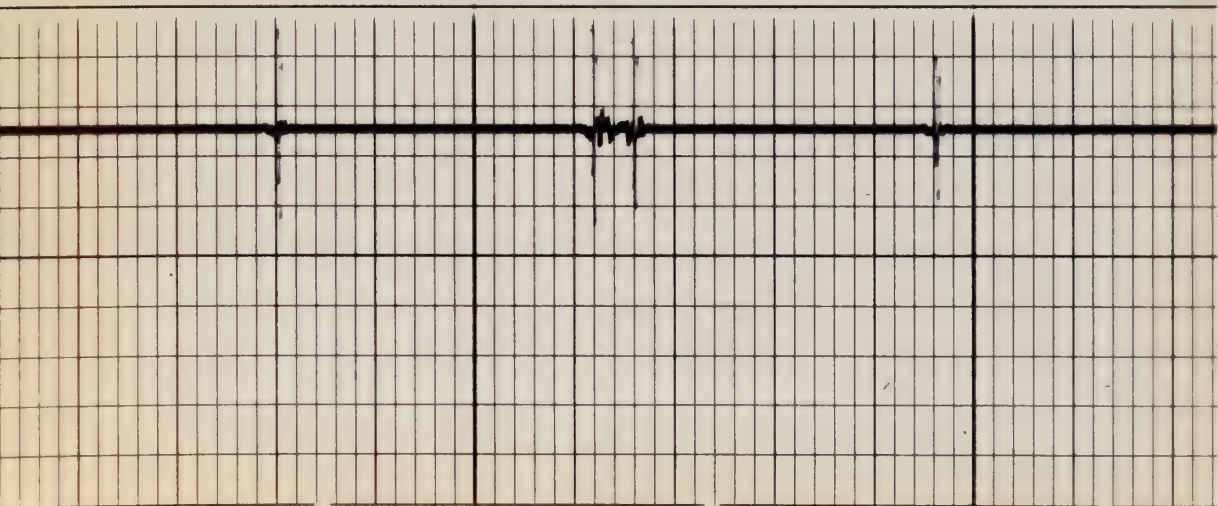






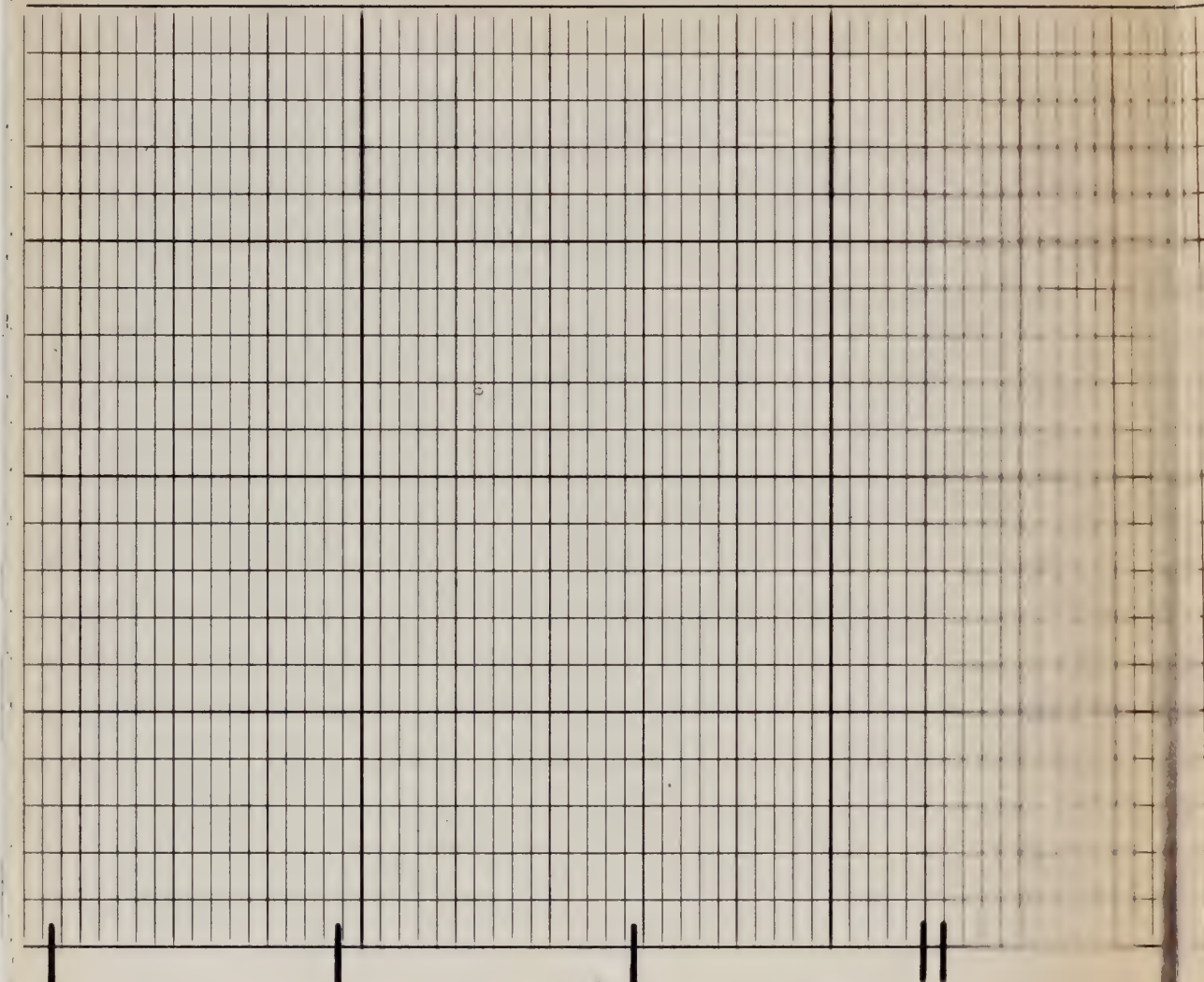
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1300

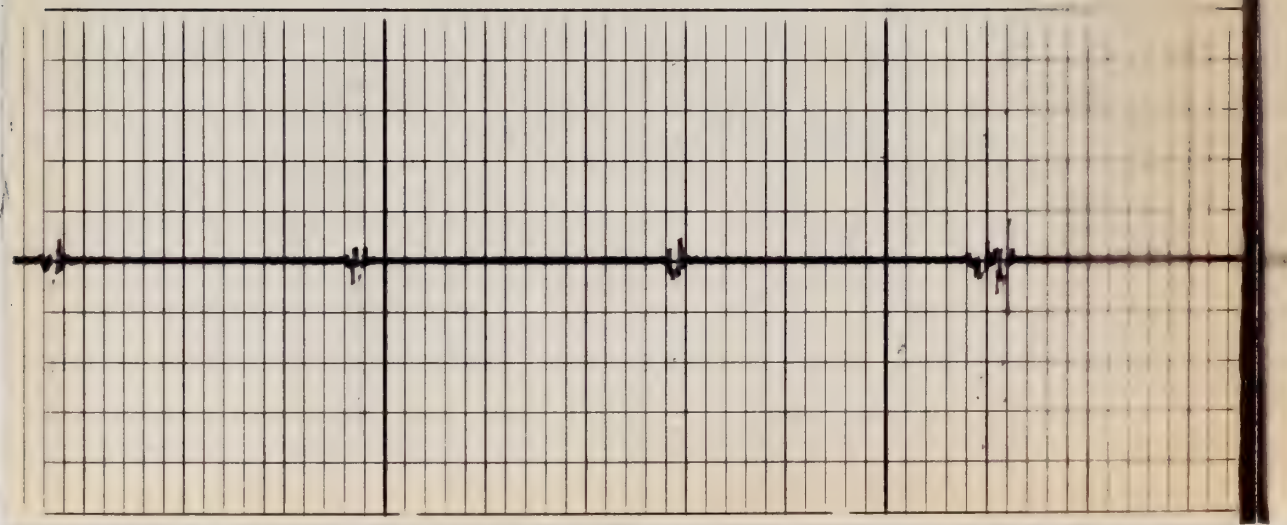


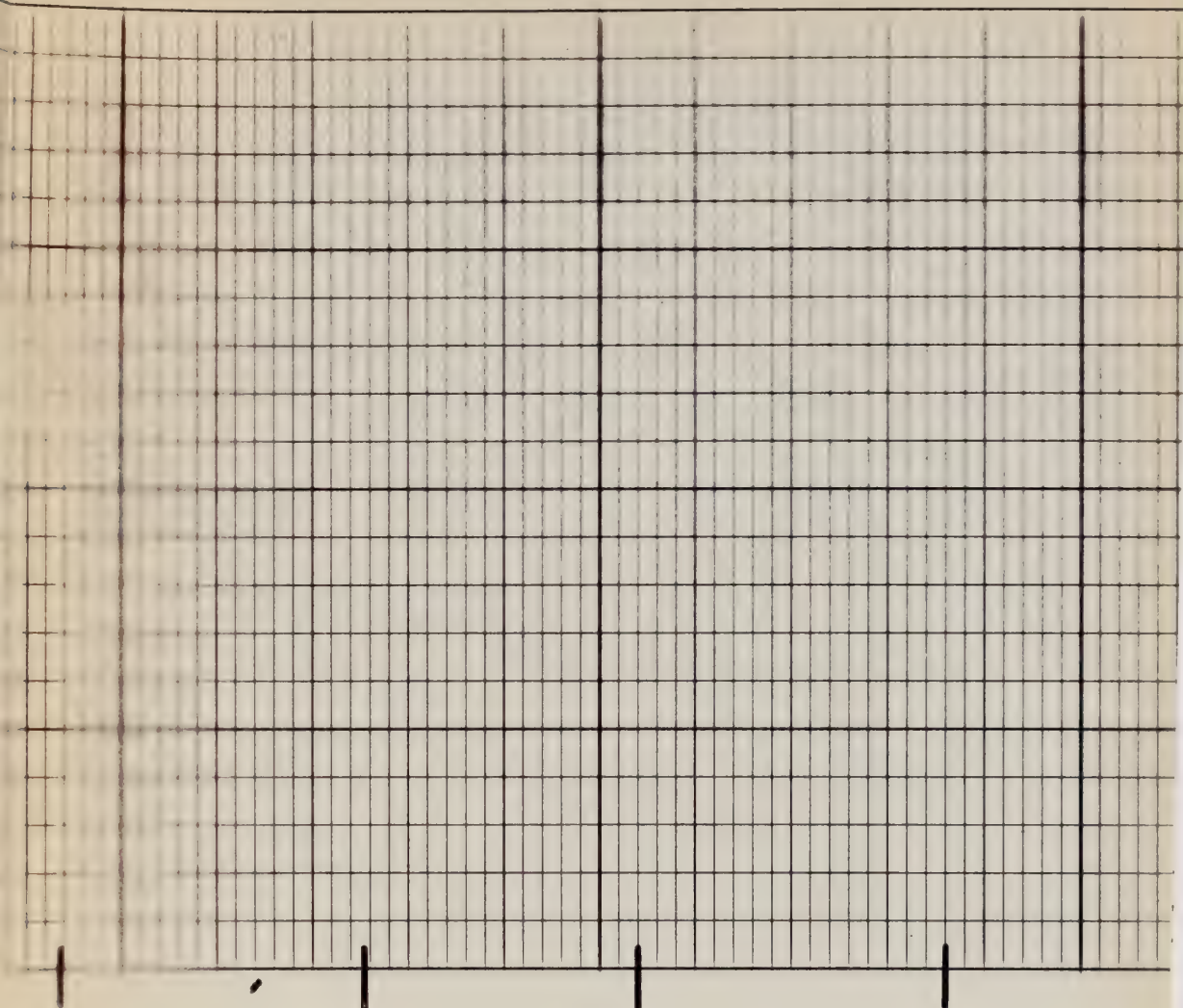
INDICATED INTERVAL
PERFORATED ONE SHOT PER
FOOT WITH 1 11/16"
HYPERDOME

1400

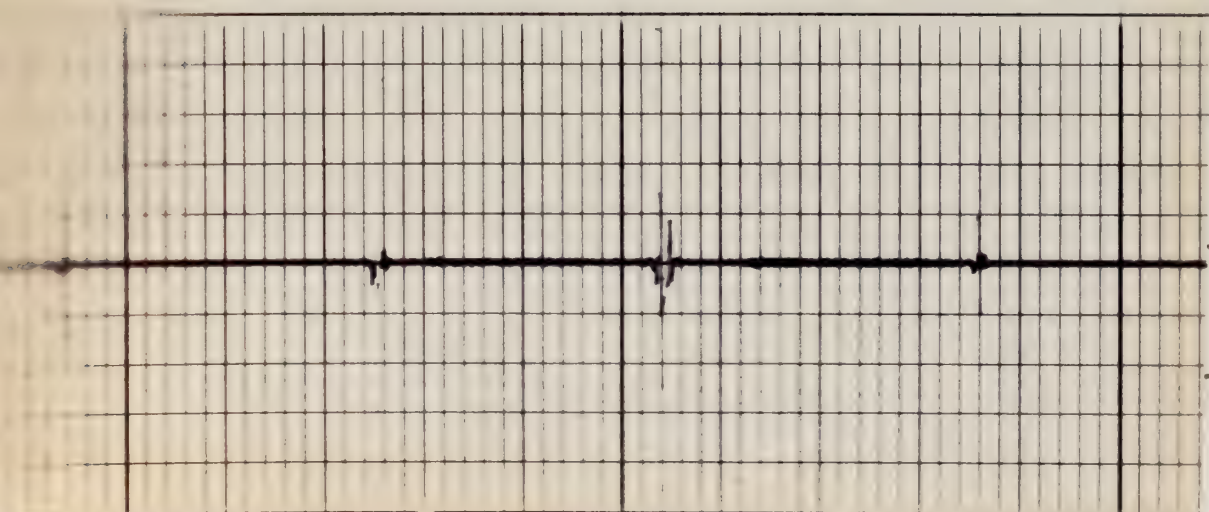


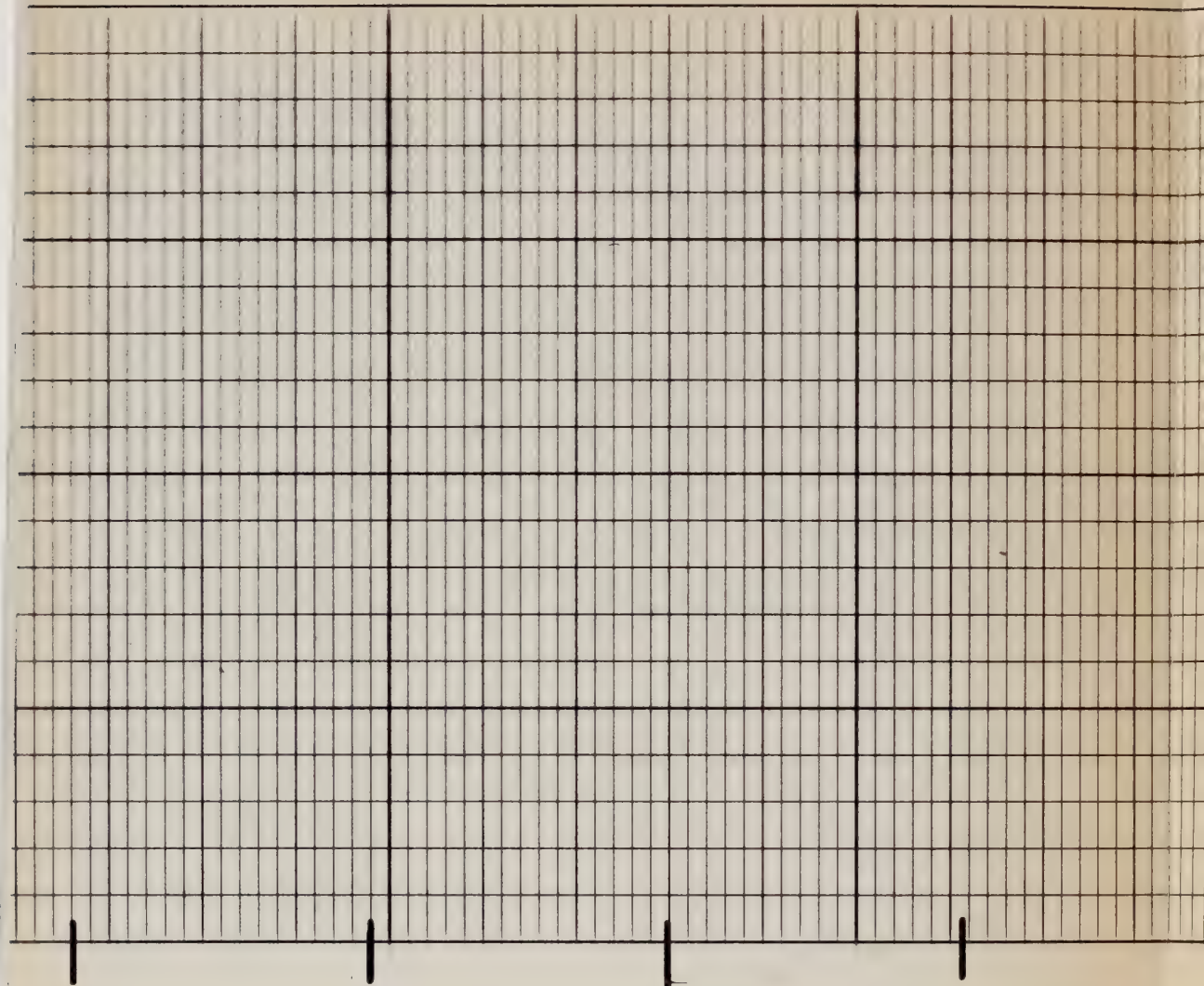
1000



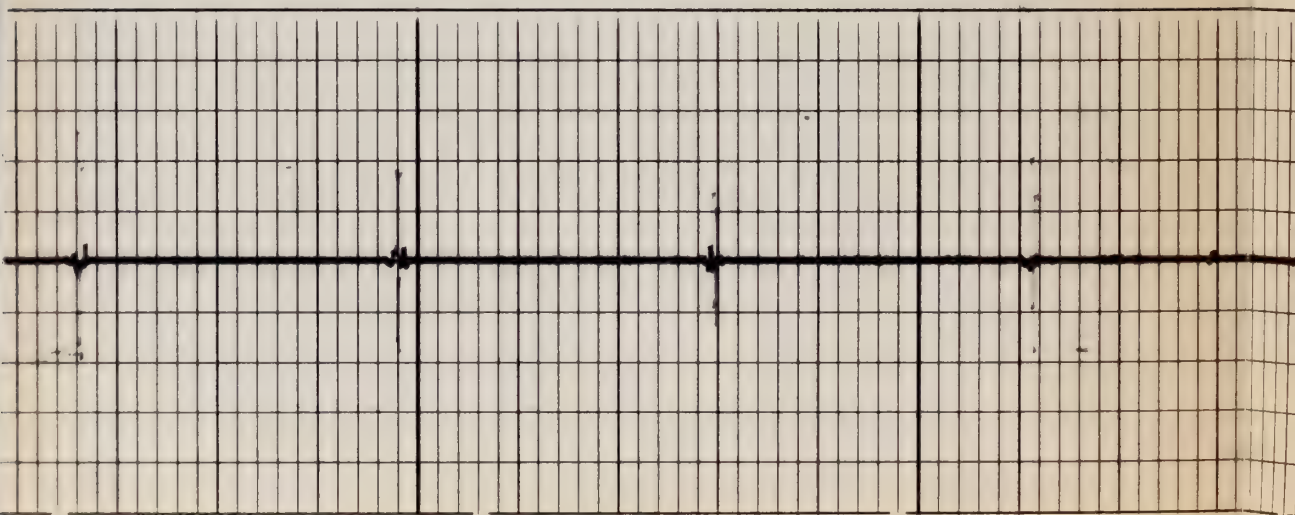


1100

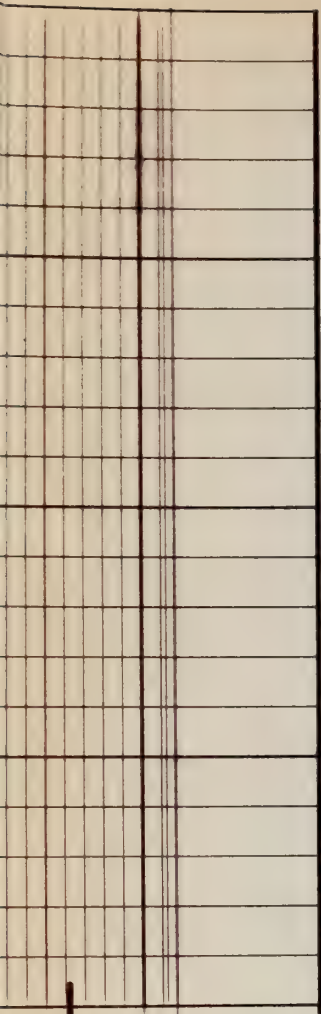
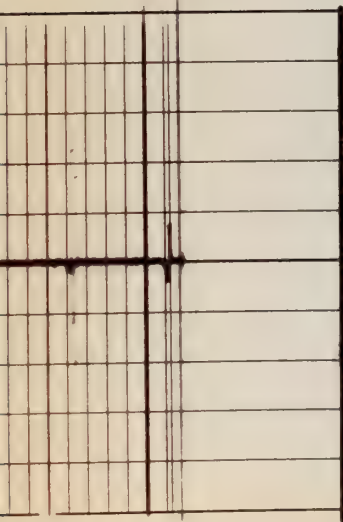




200

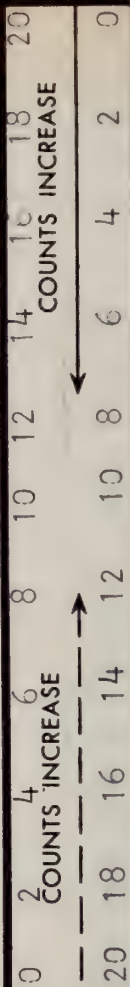


1300

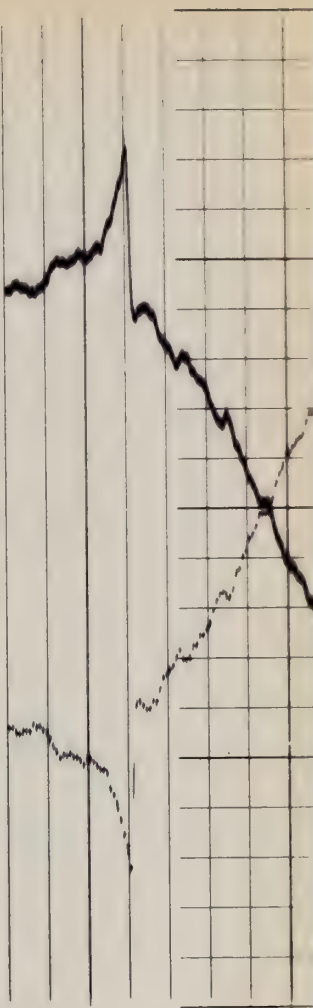
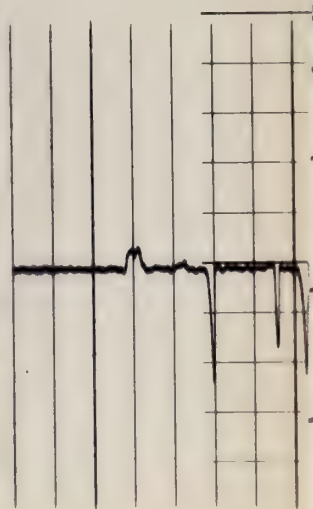


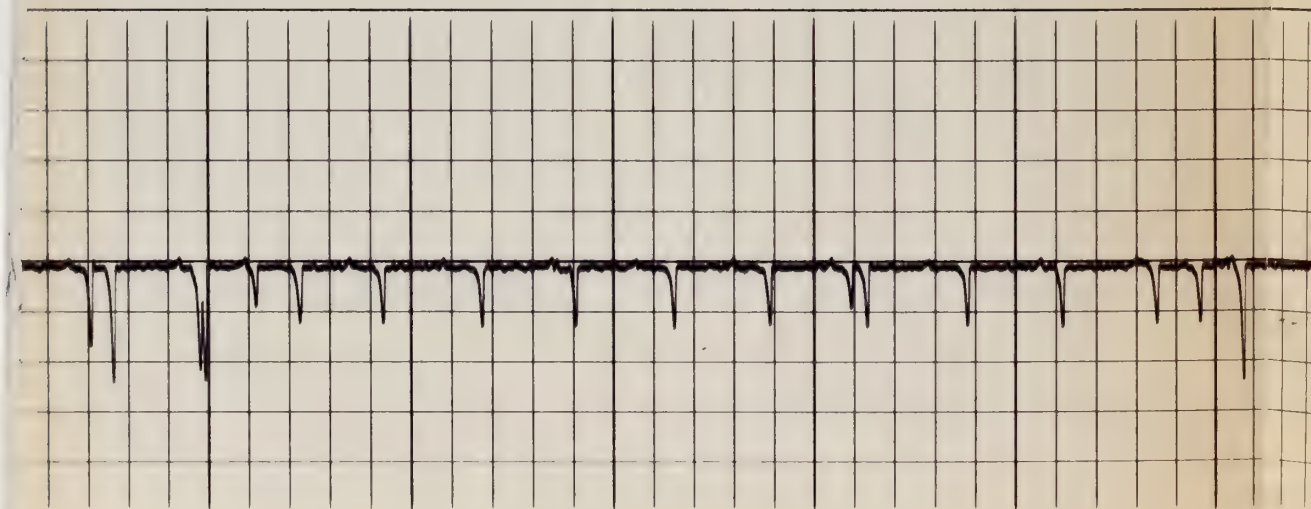
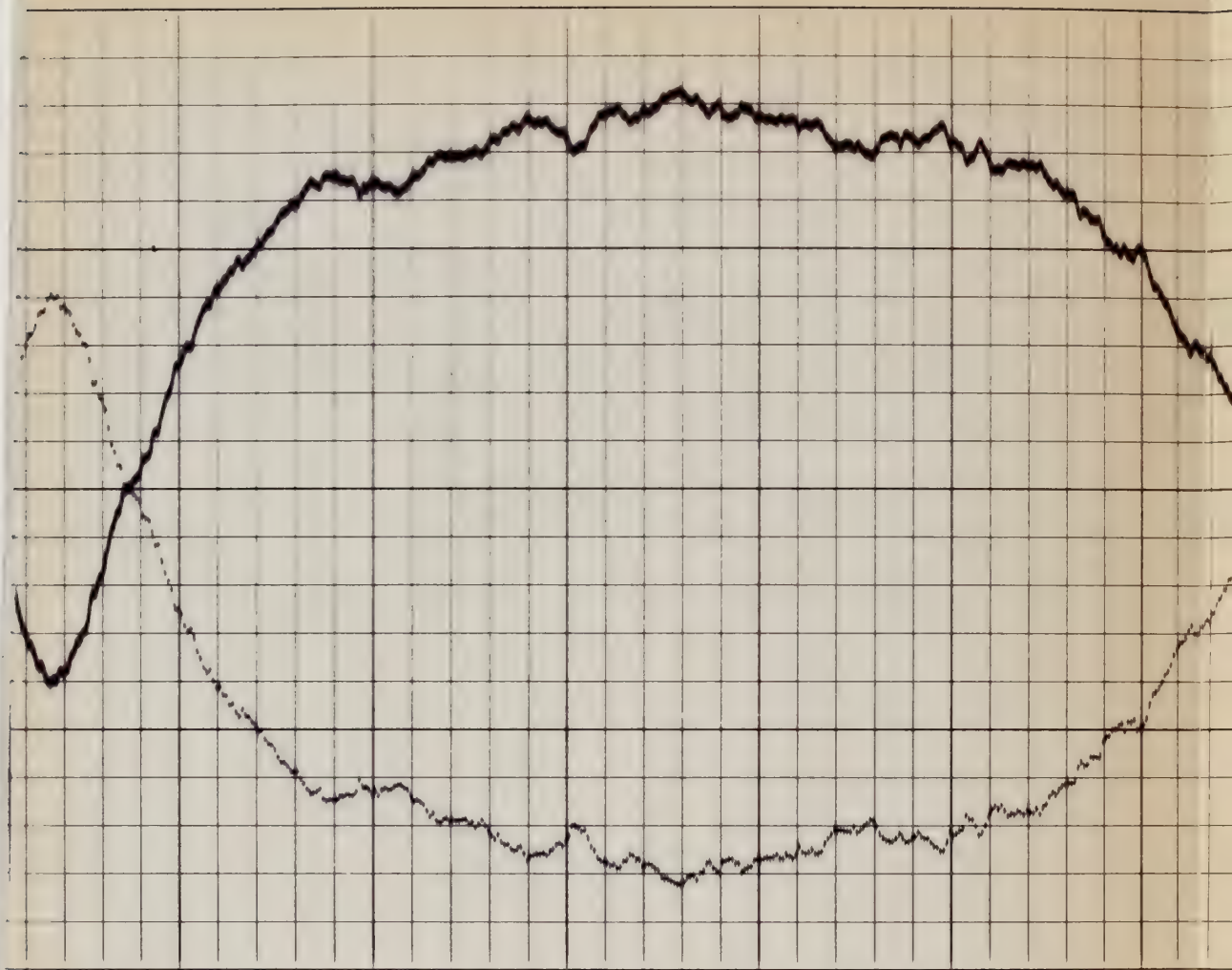
INDEXING
RECORD

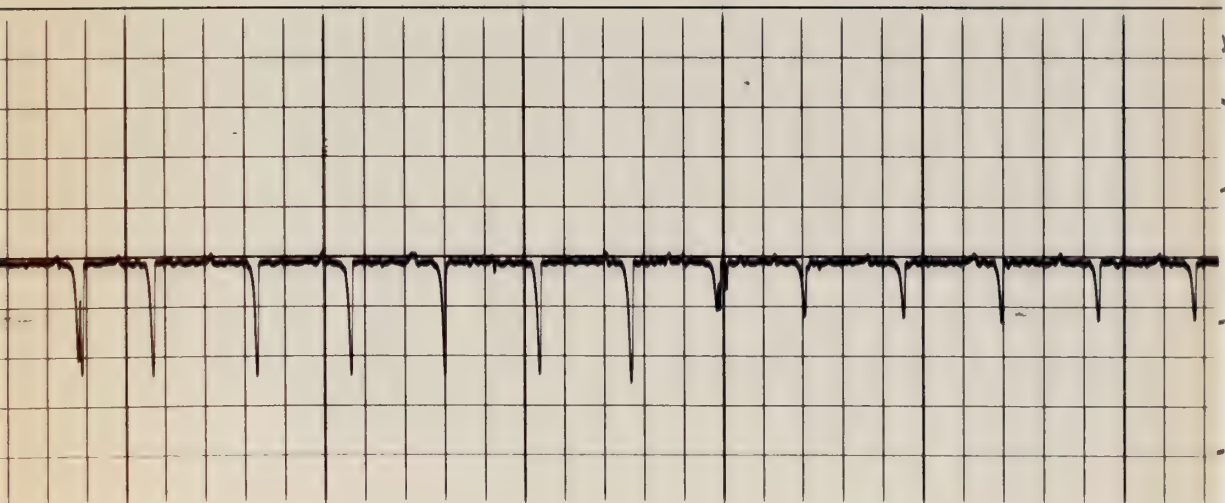
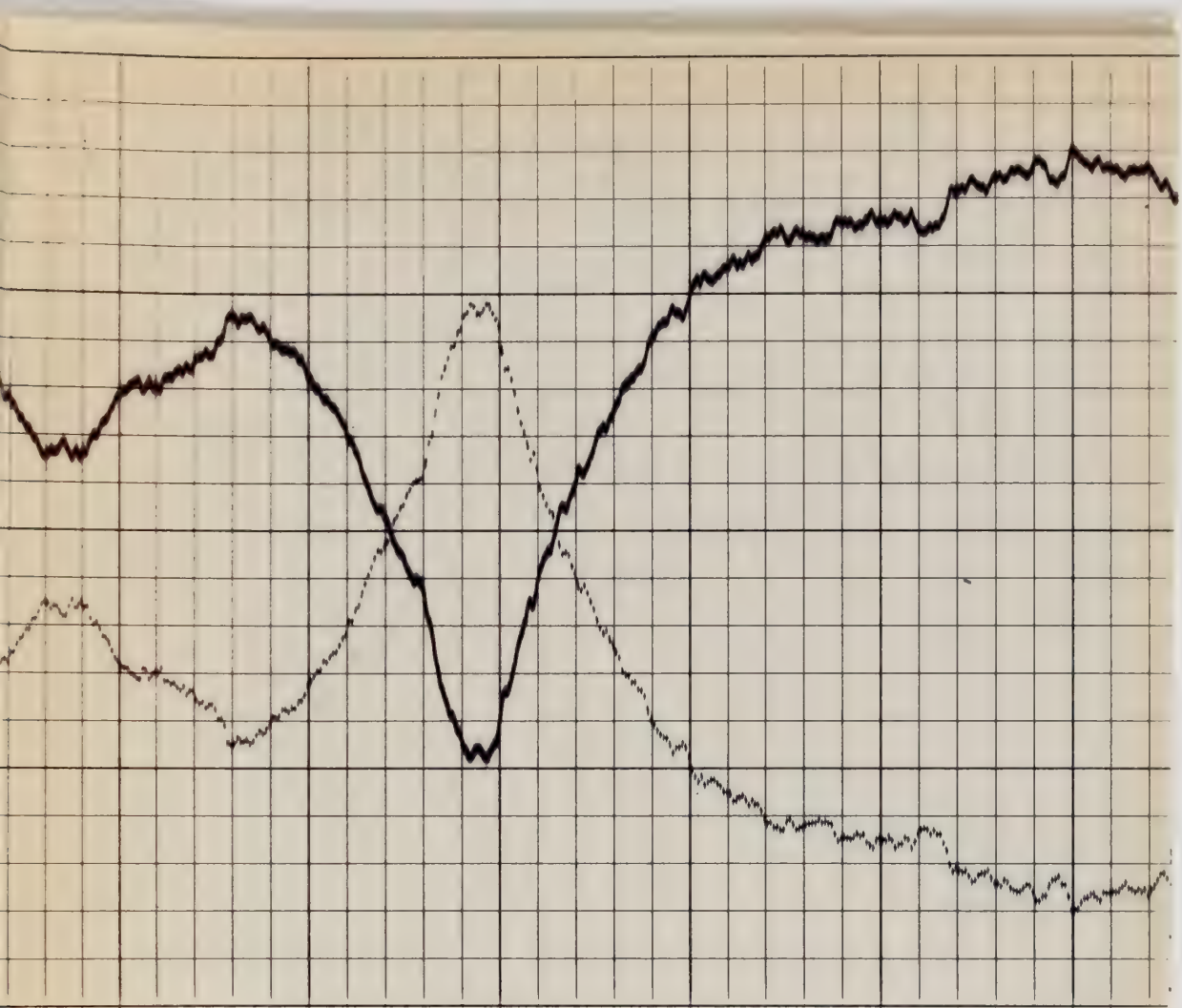
RADIOORIENTATION
RECORD

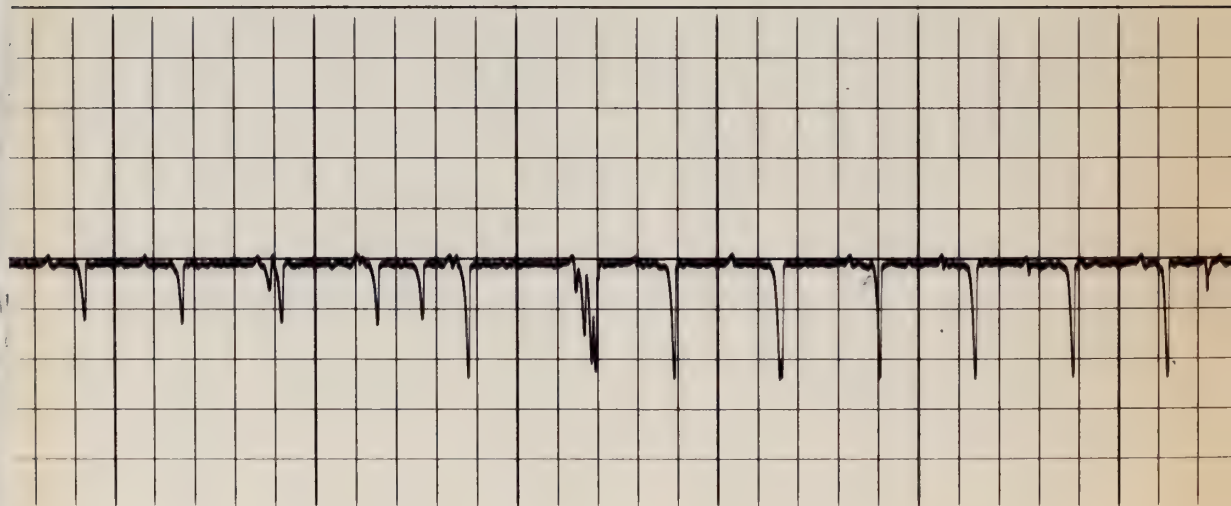
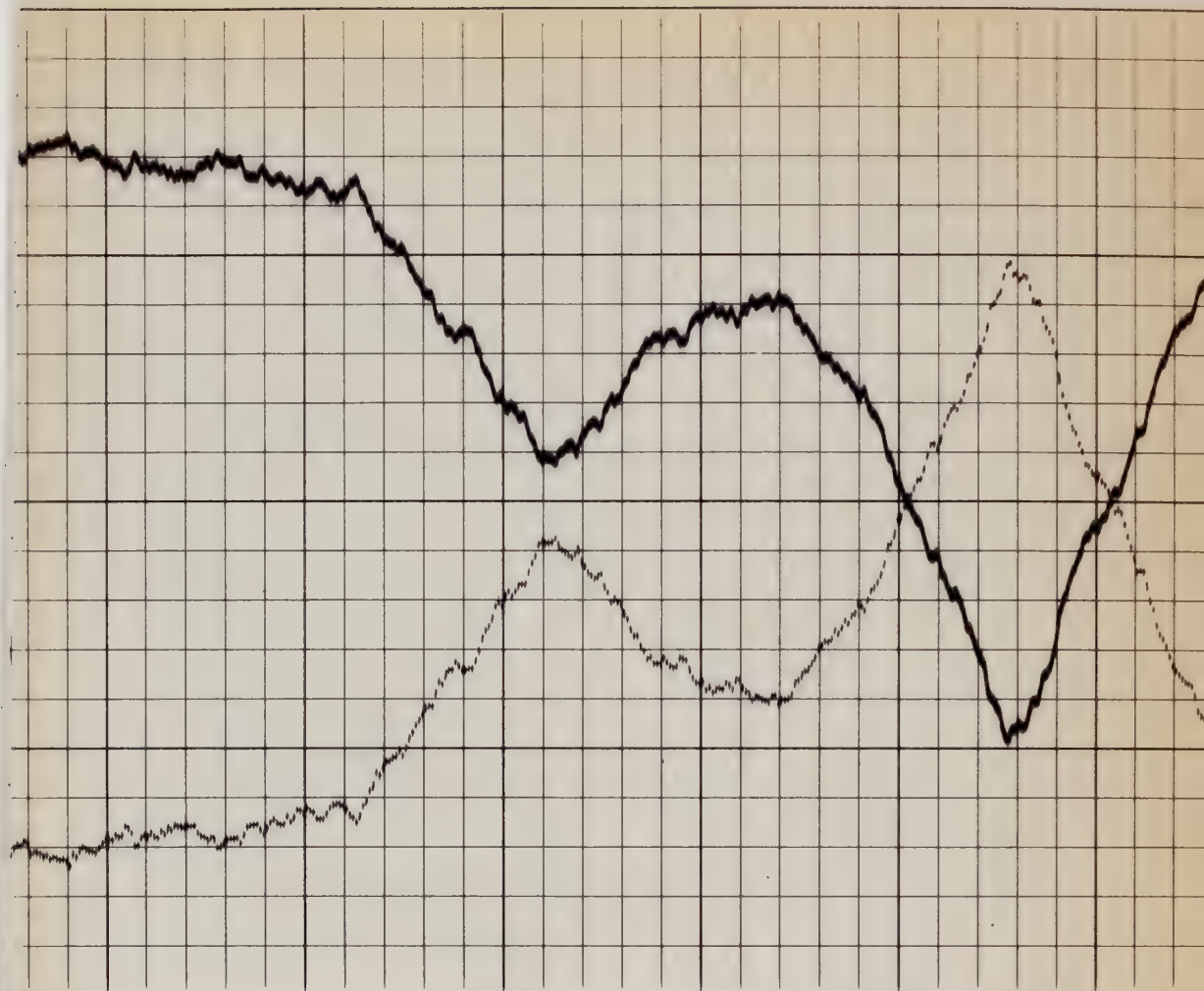


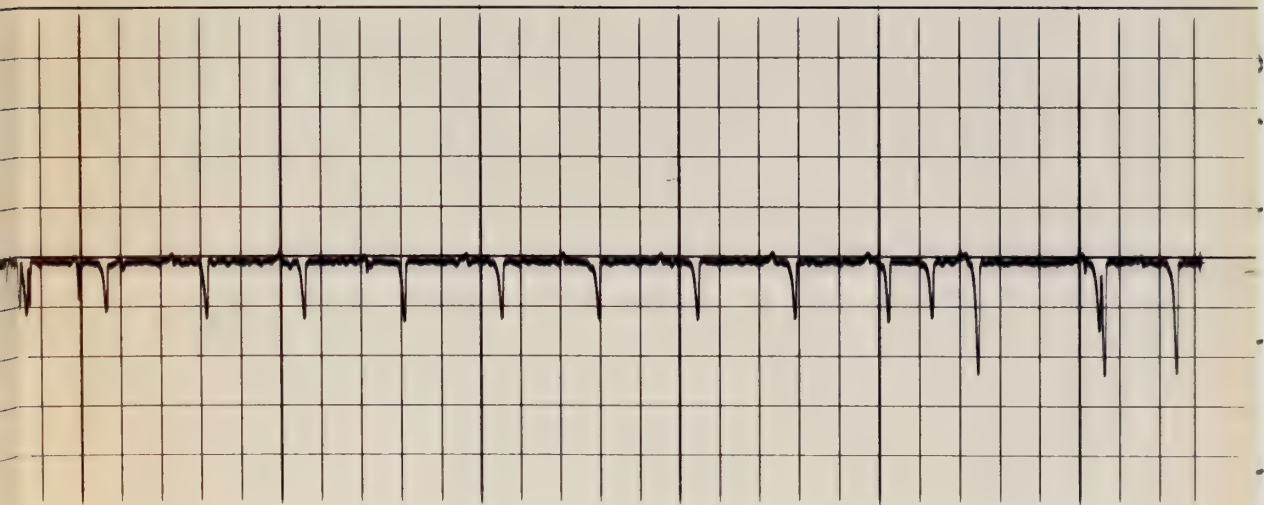
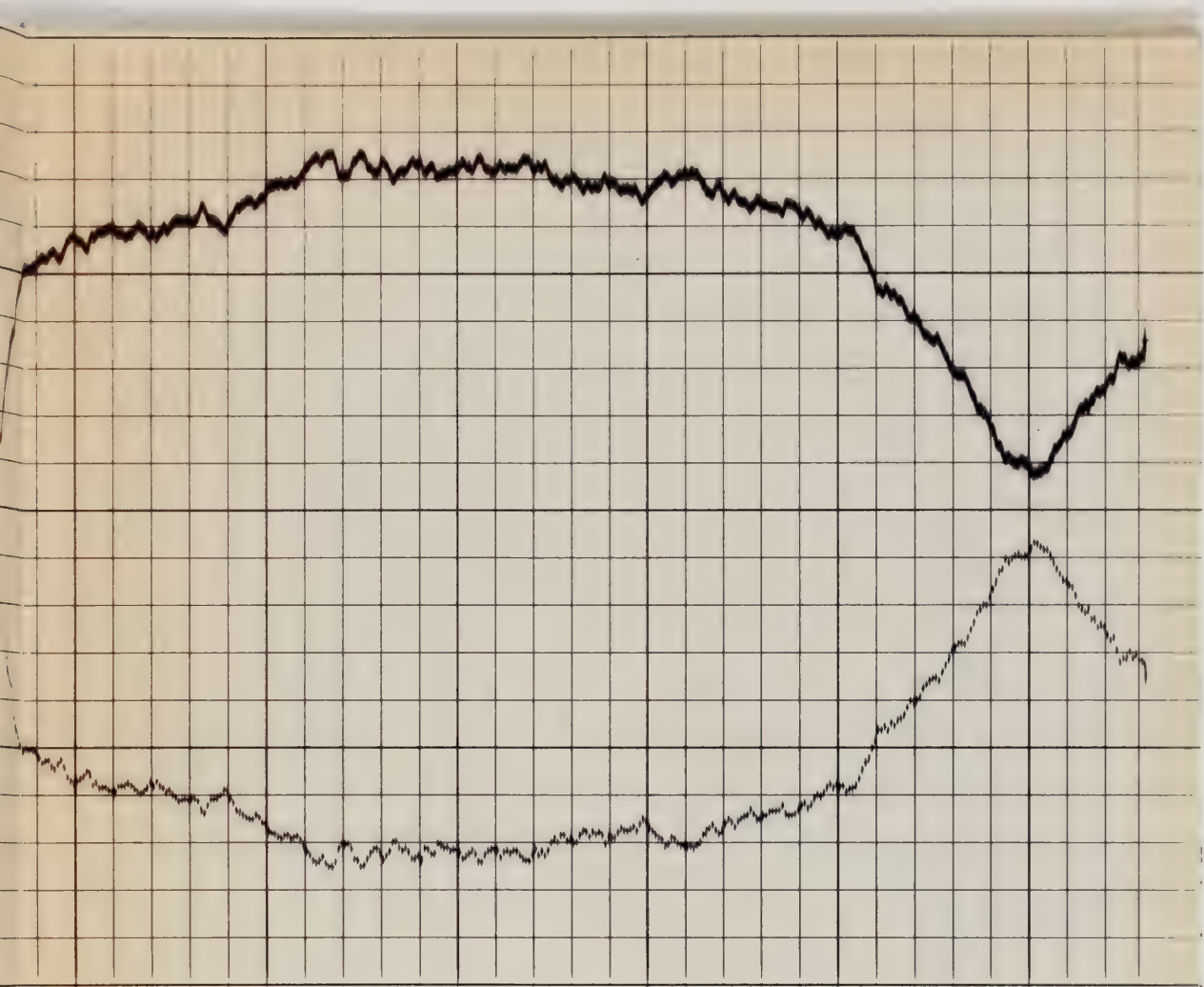
NO. 3-SHORT STRING
TYPICAL ORIENTING PATTERN OF NO. 3 STRING









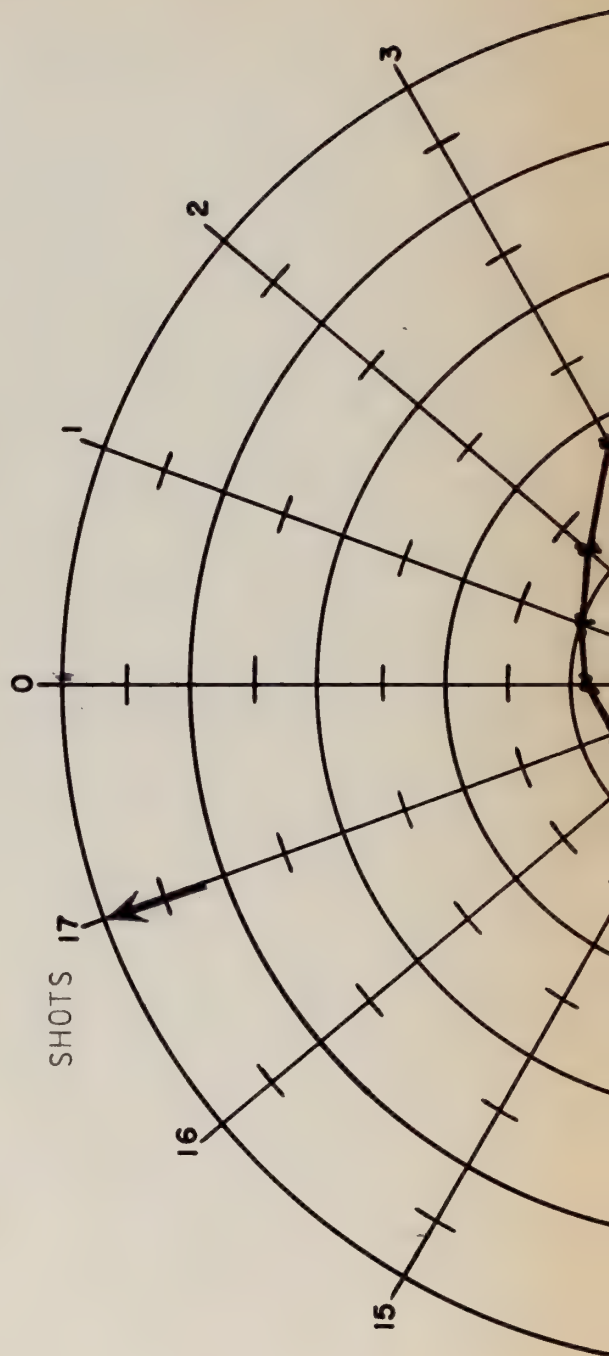


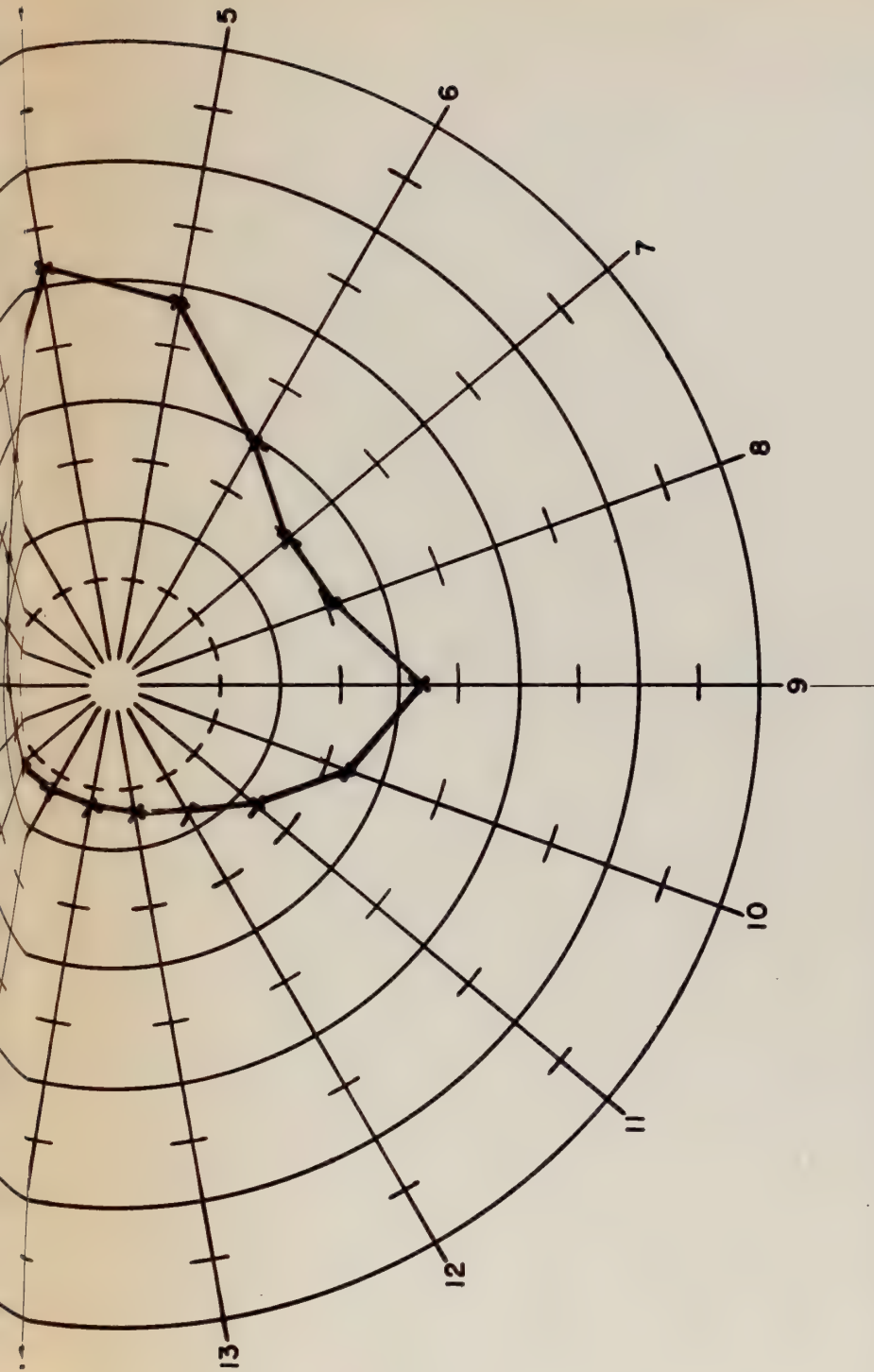
[illegible]

RADIORIENTATION PLOT

POT-B

NO. 3-SHORT STRING PERFORATED 1280-1290 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





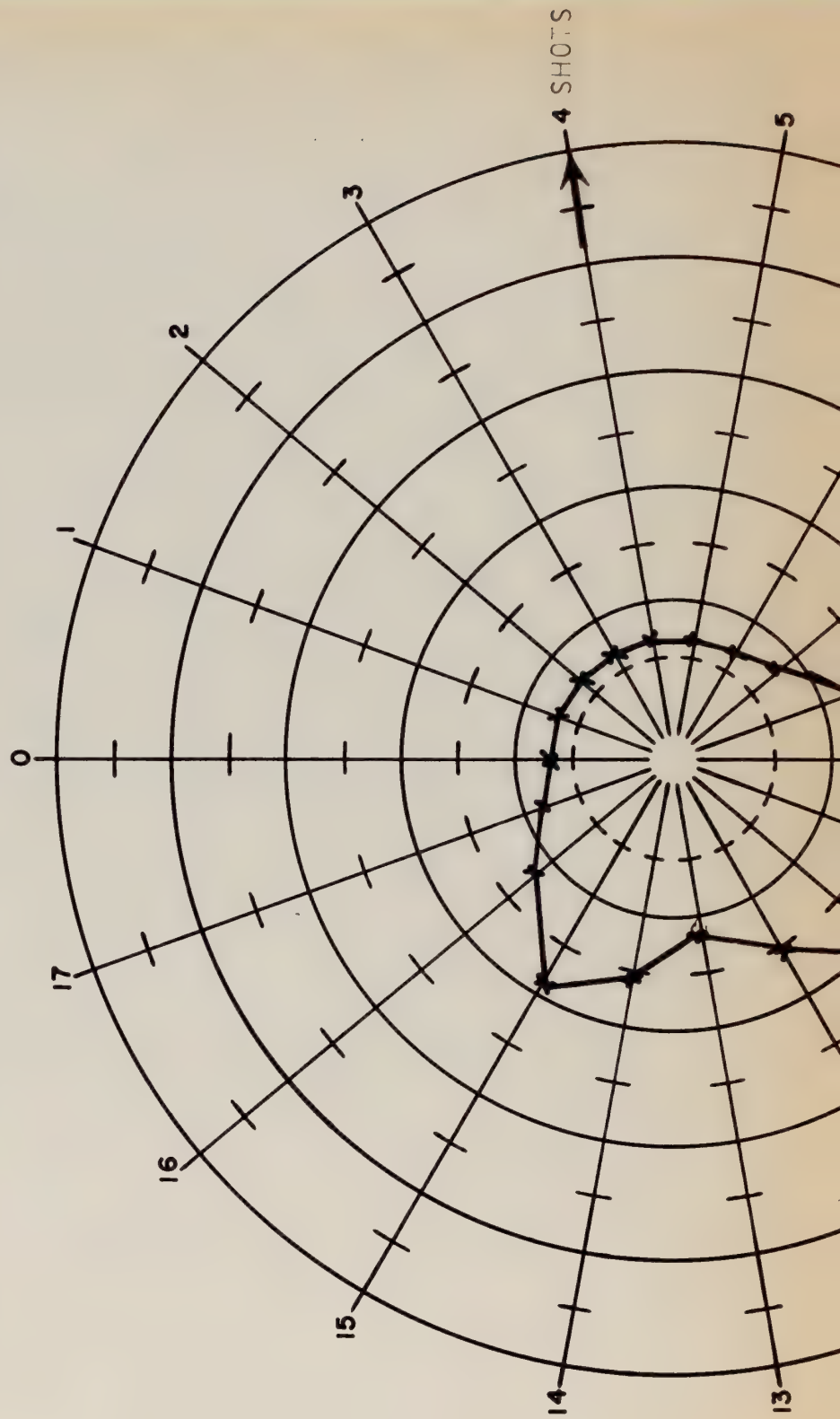
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

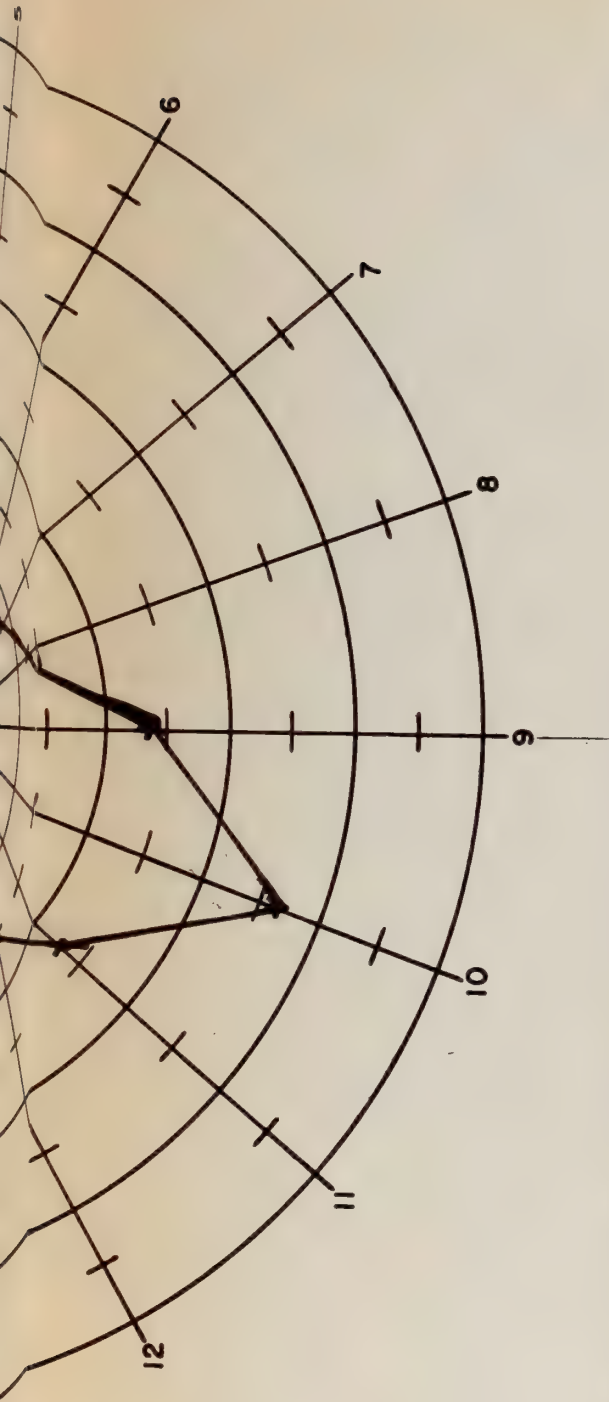
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 3--SHORT STRING PERFORATED 1269-1279 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

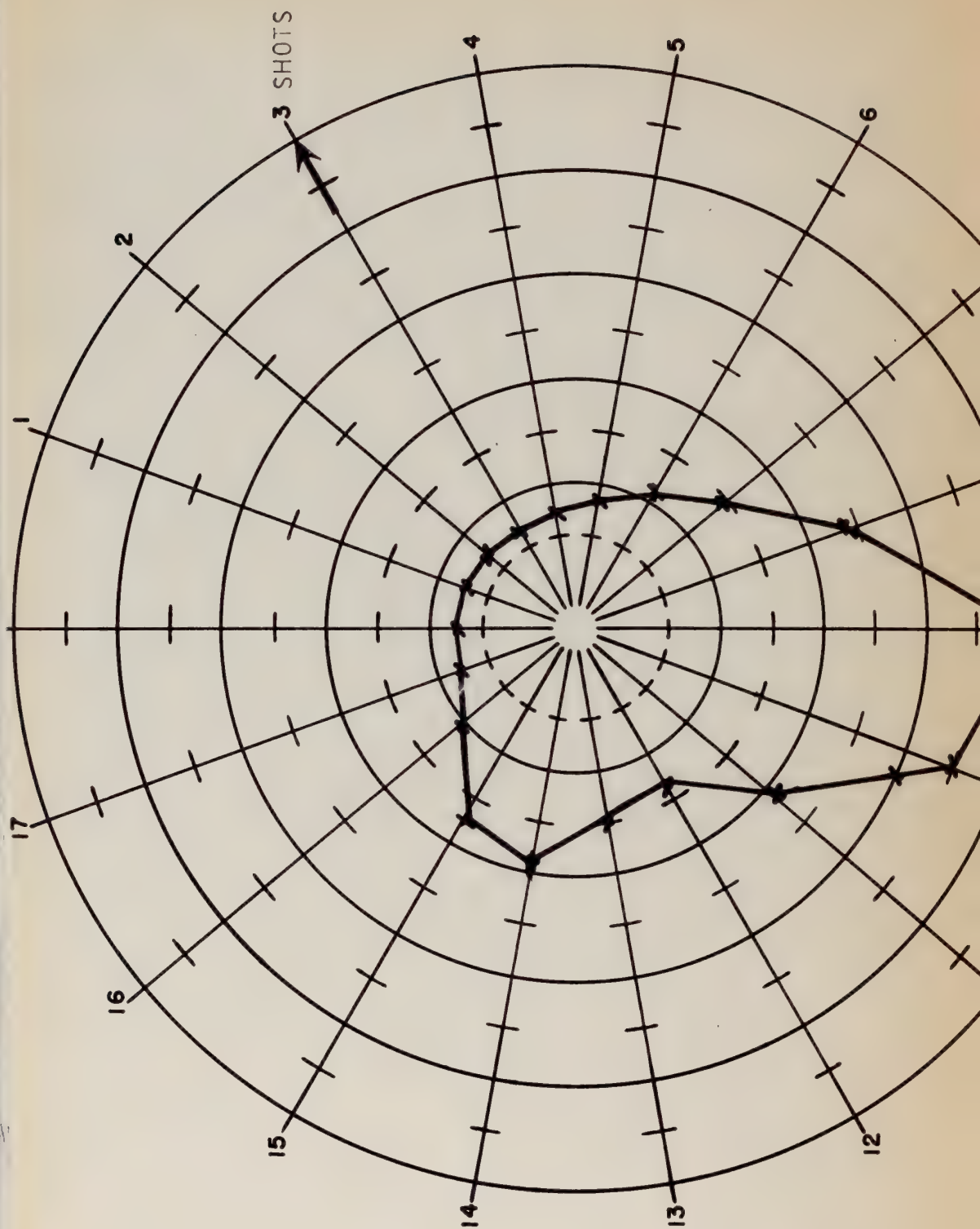
Schlumberger

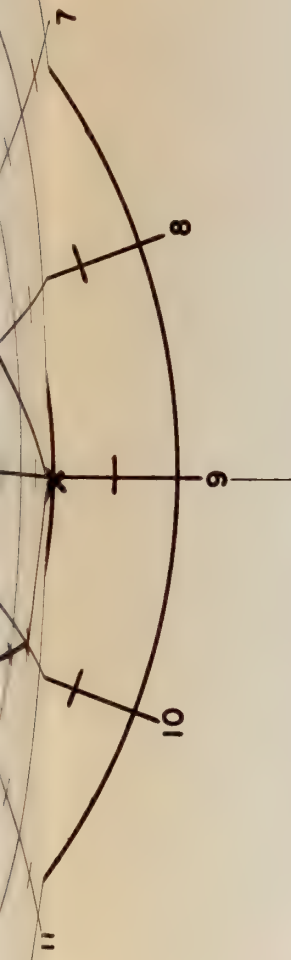
RADIOORIENTATION PLOT

POT-B

NO. 3 SHORT STRING PERFORATED 1258-1268 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

0





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

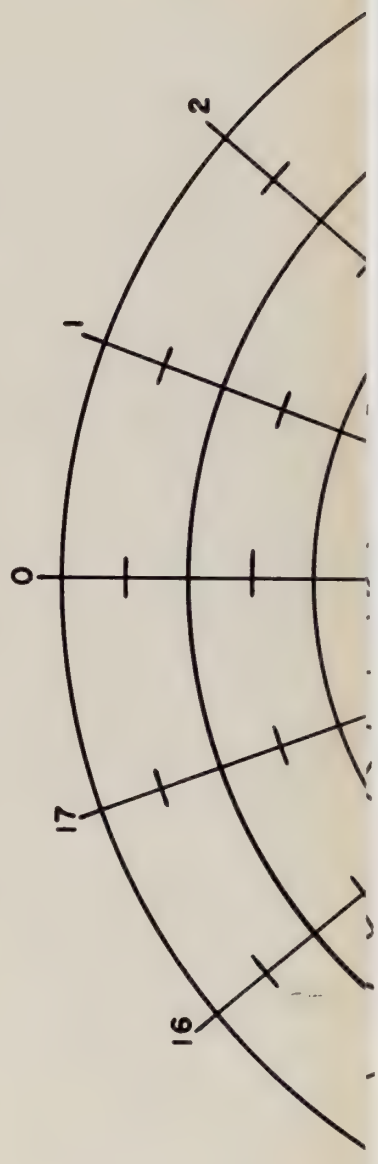


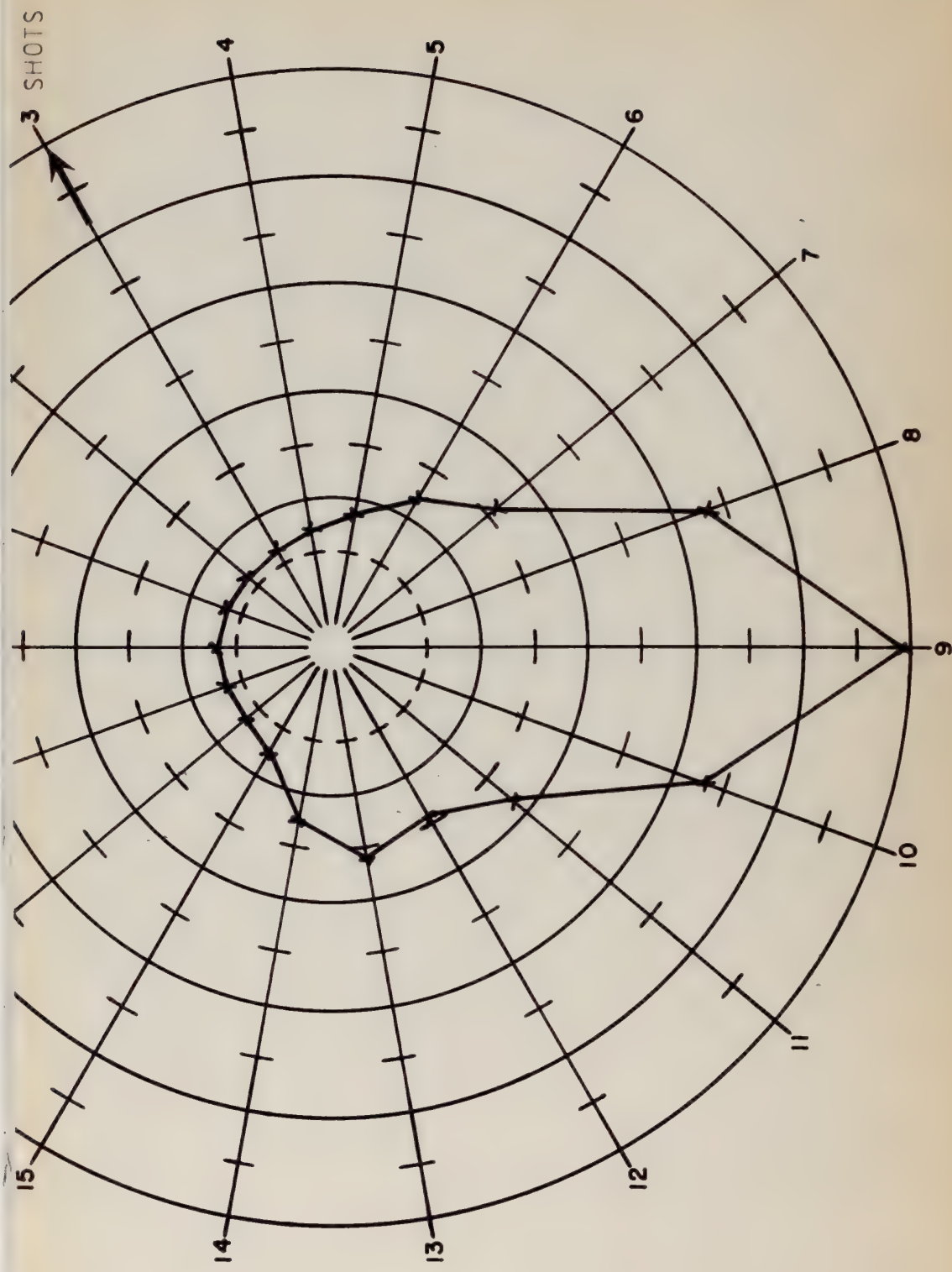
NO. 3-SHORT STRING PERFORATED 1247-1257 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

RADIOORIENTATION PLOT

POT-B

NO. 3-SHORT STRING PERFORATED 1247-1257 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





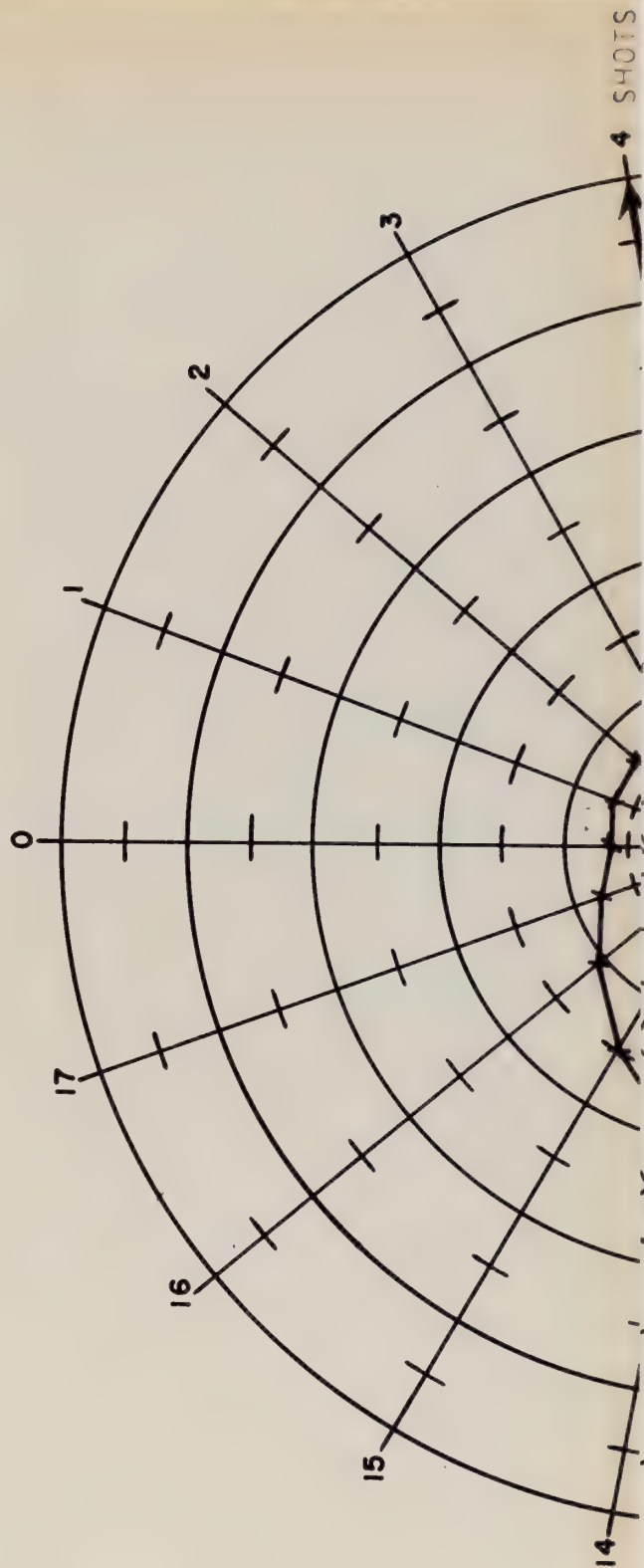
as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

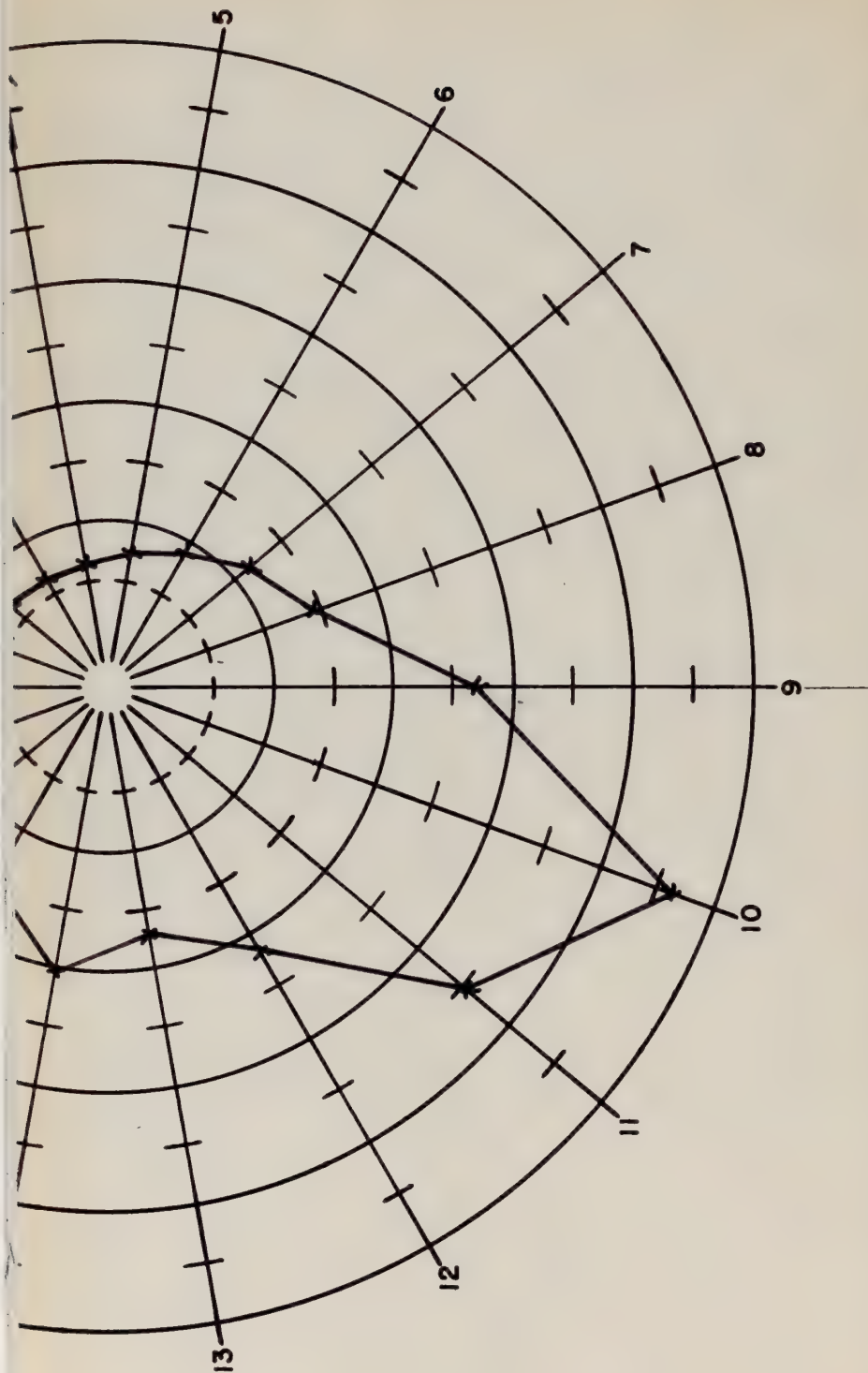
Schlumberger

RADIOORIENTATION PLOT

POT-B

N.C. 3-SHORT STRING PERFORATED 1236-1246 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





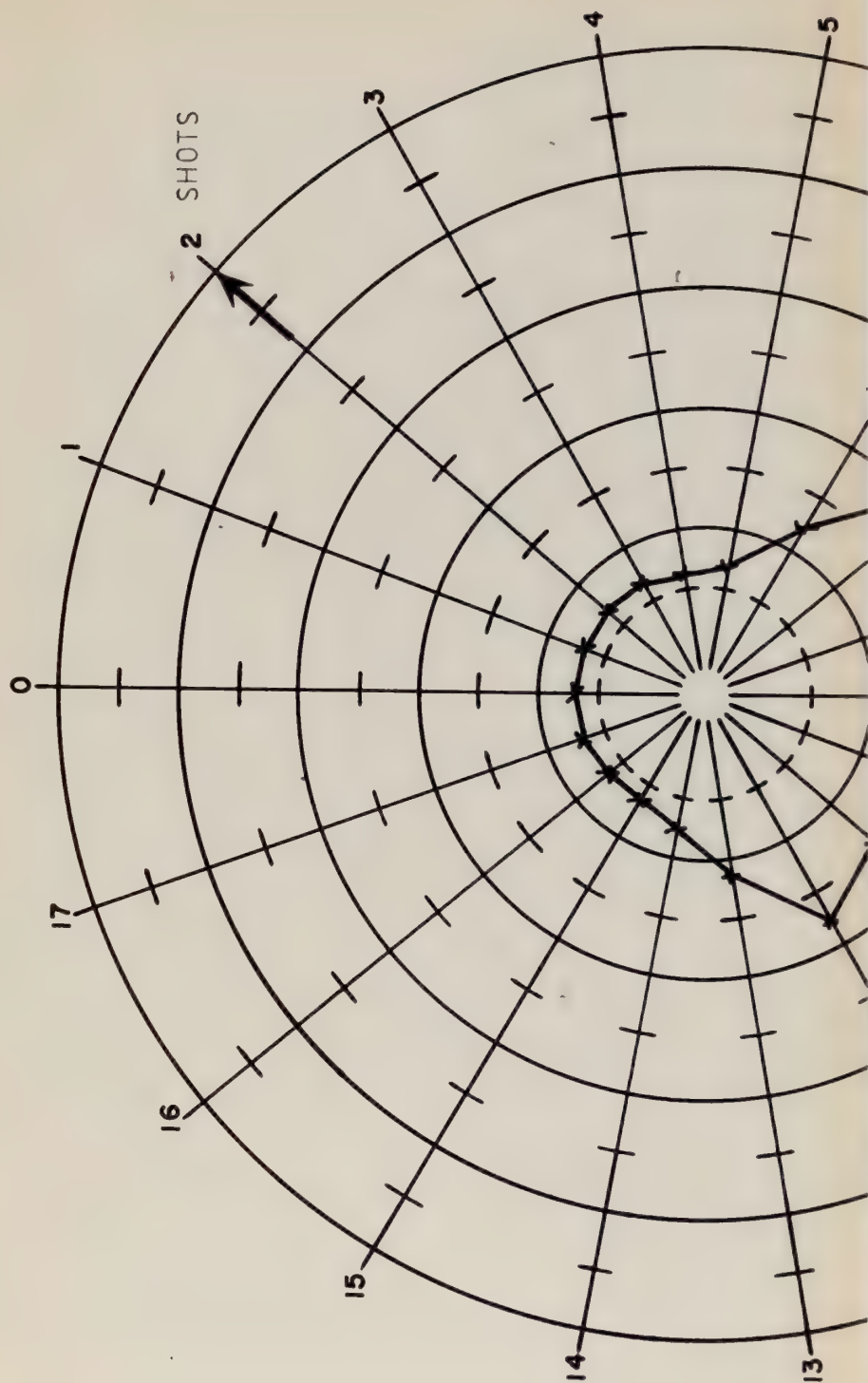
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

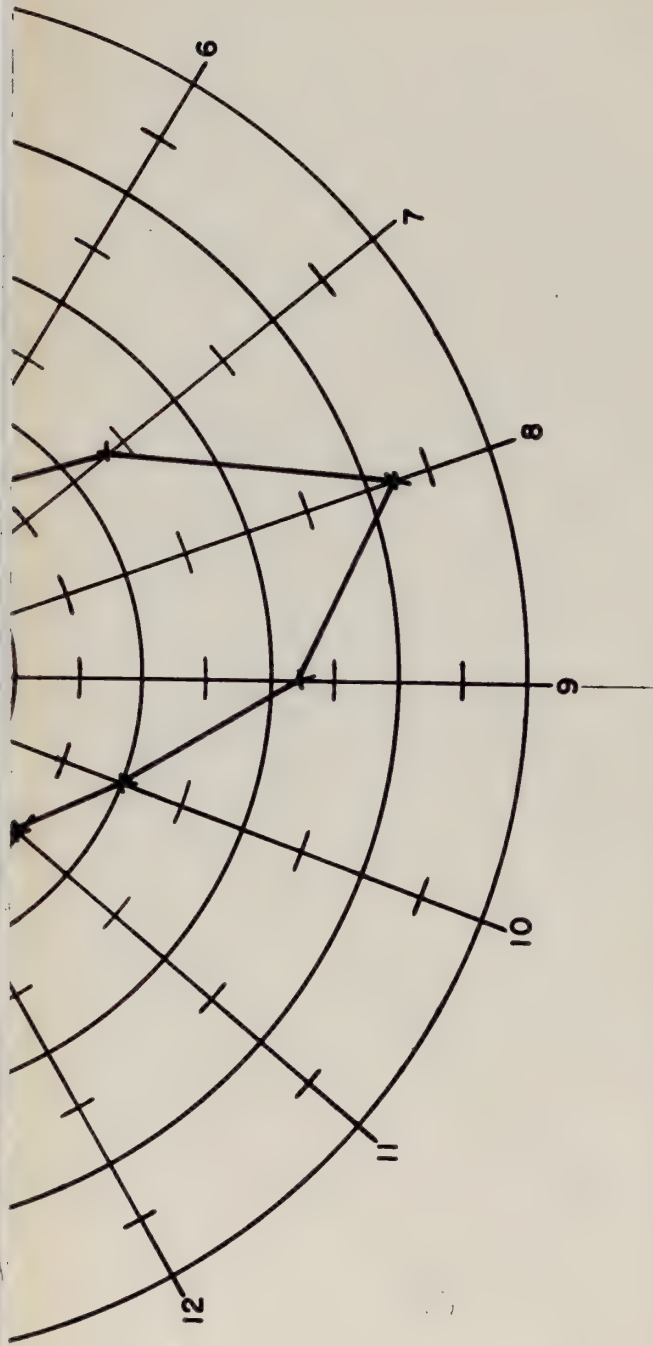
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3--SHORT STRING PERFORATED 1225-1235 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



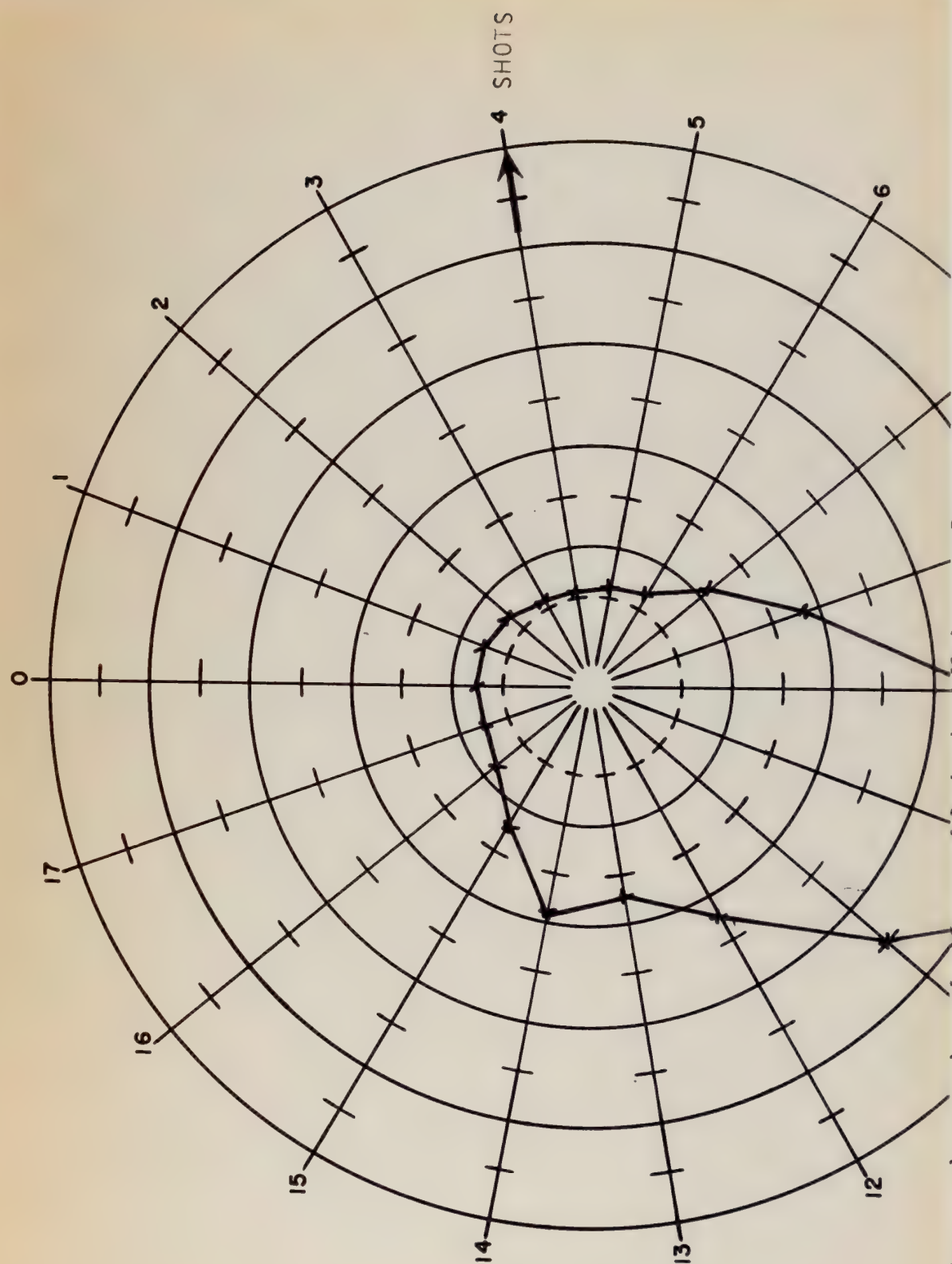


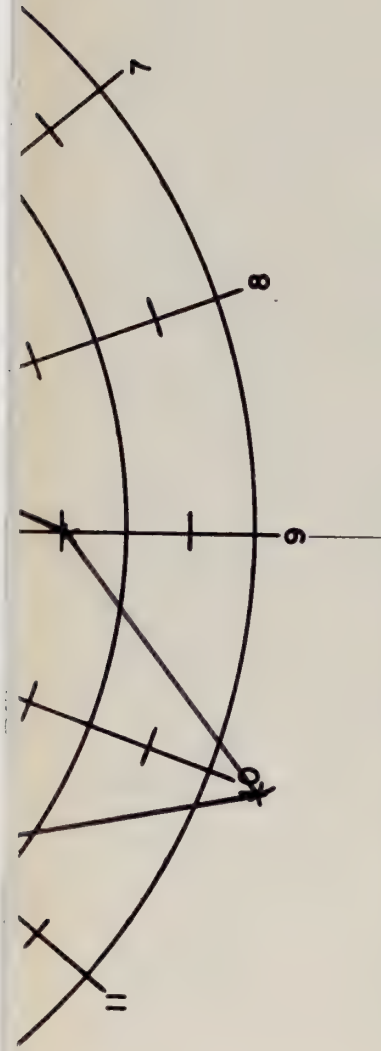
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIORIENTATION PLOT
DOT-B

NO. 3 SHOT STRING. PERFORATED 1214 1224 POT-B ONE SIGHT PER FOOT WITH 11.75 IN. OF LEAD



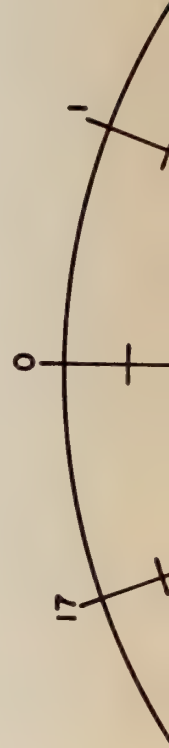


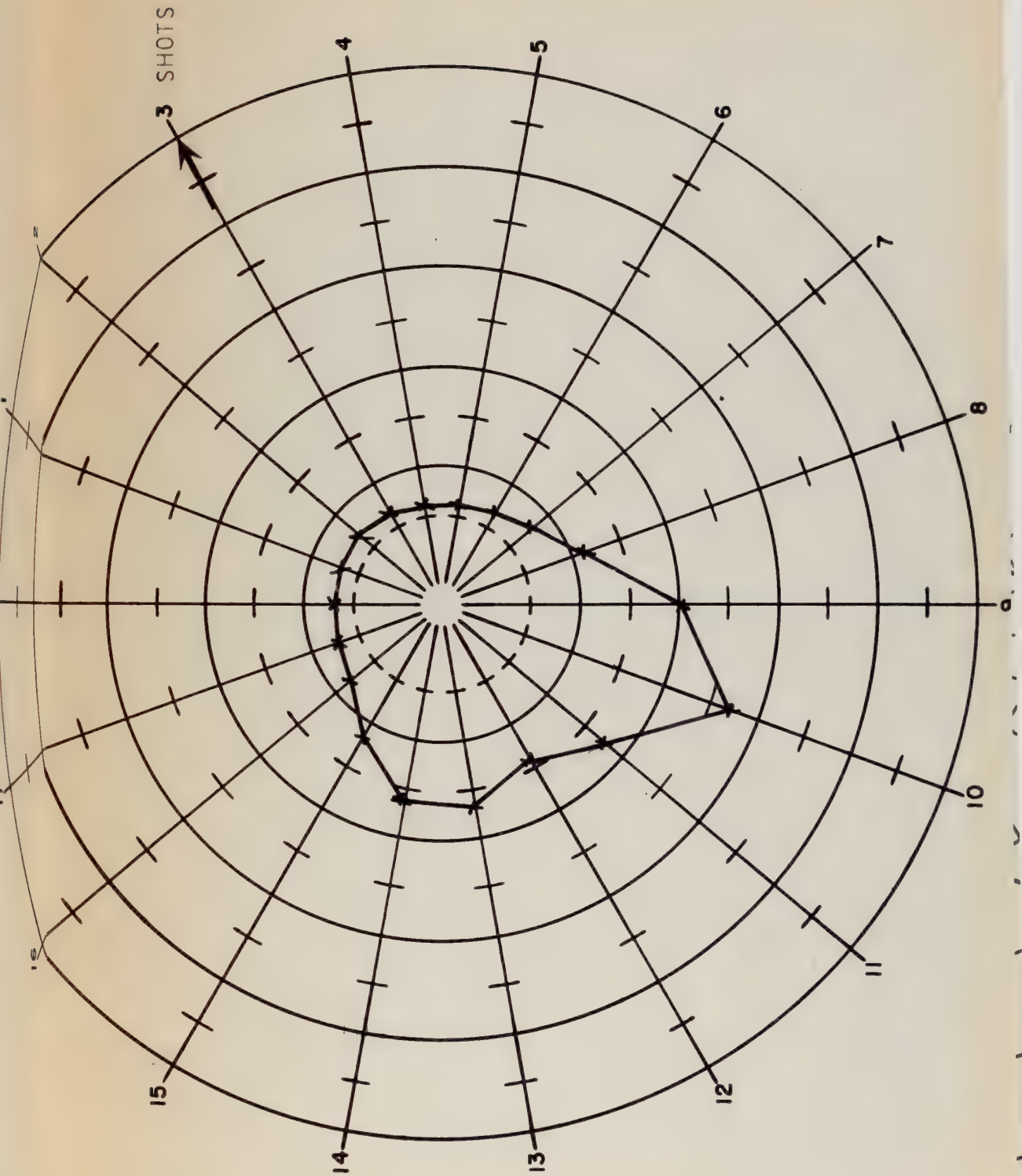
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIO-ORIENTATION PLOT POT-B

NO. 3--SHORT STRING PERFORATED 1203-1213 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

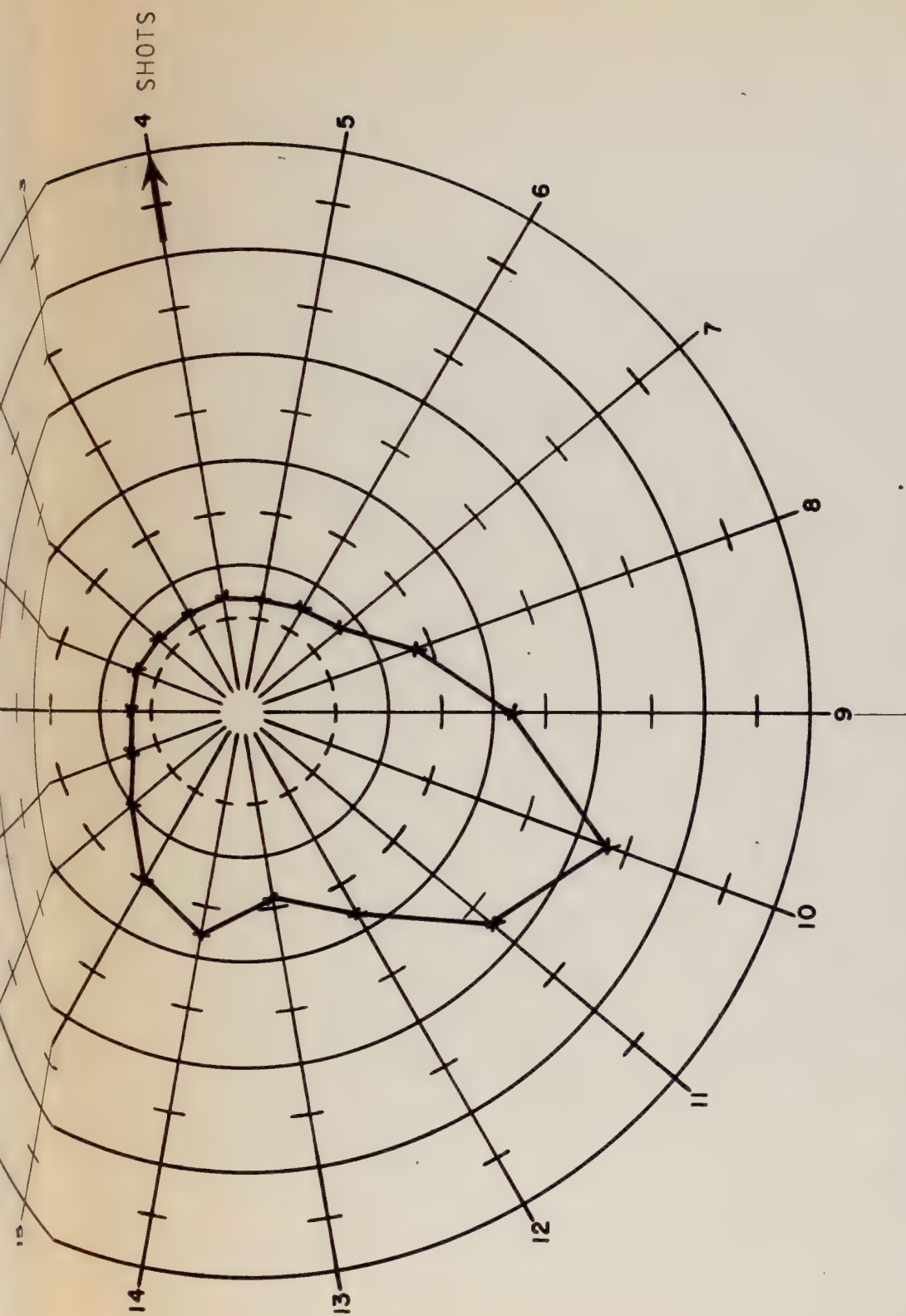
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3-SHORT STRING PERFORATED 1199-1202 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





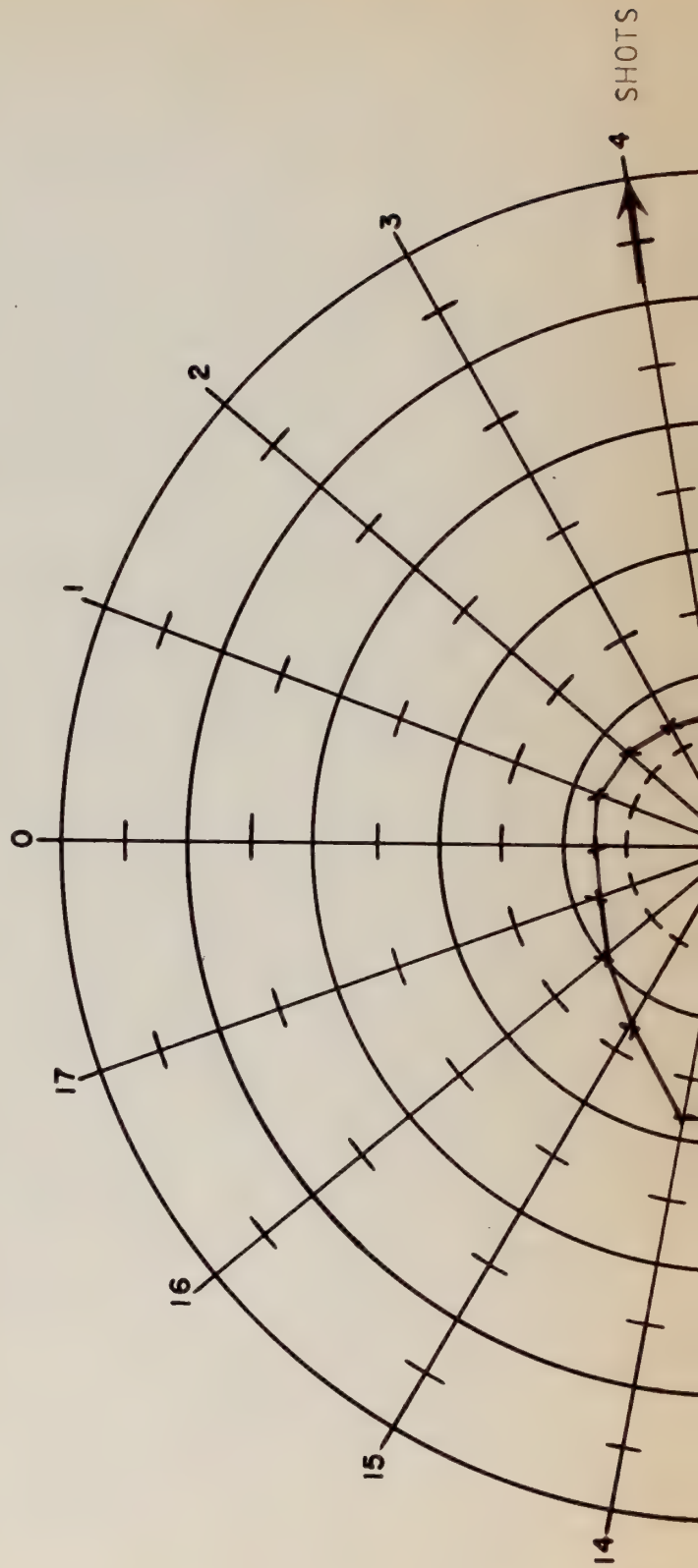
This chart, compilation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

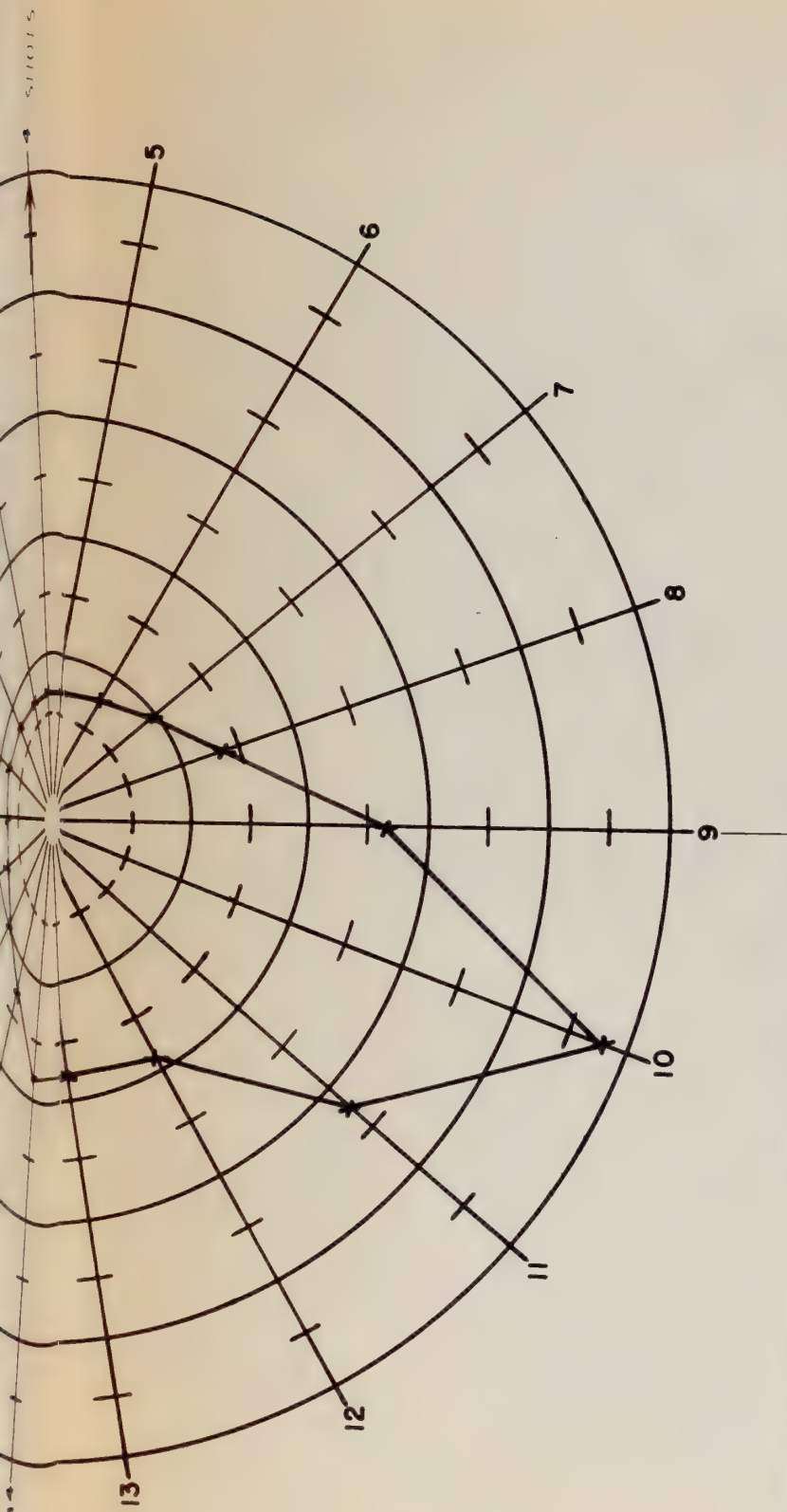
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 3-SHORT STRING PERFORATED 1188-1198 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





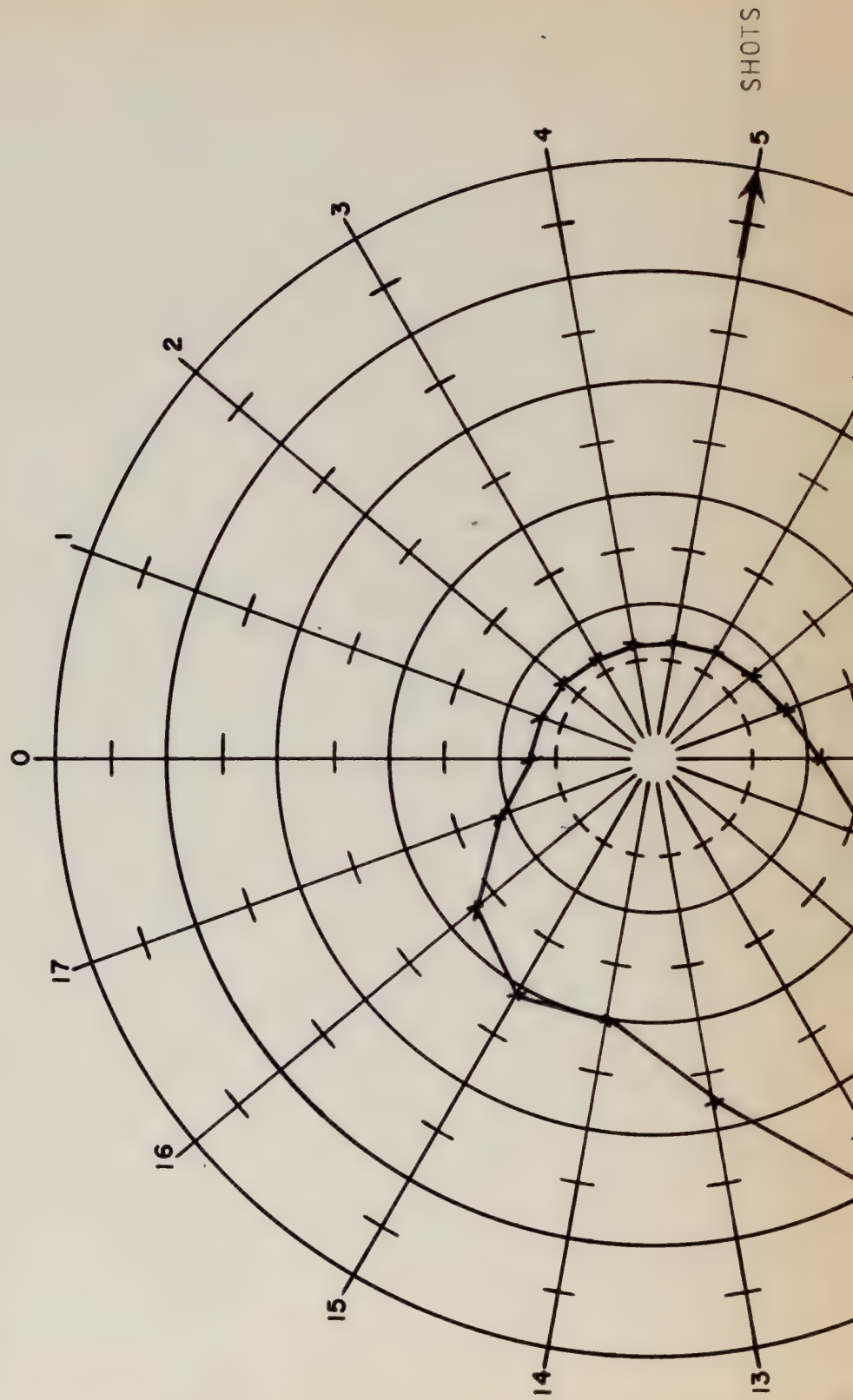
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

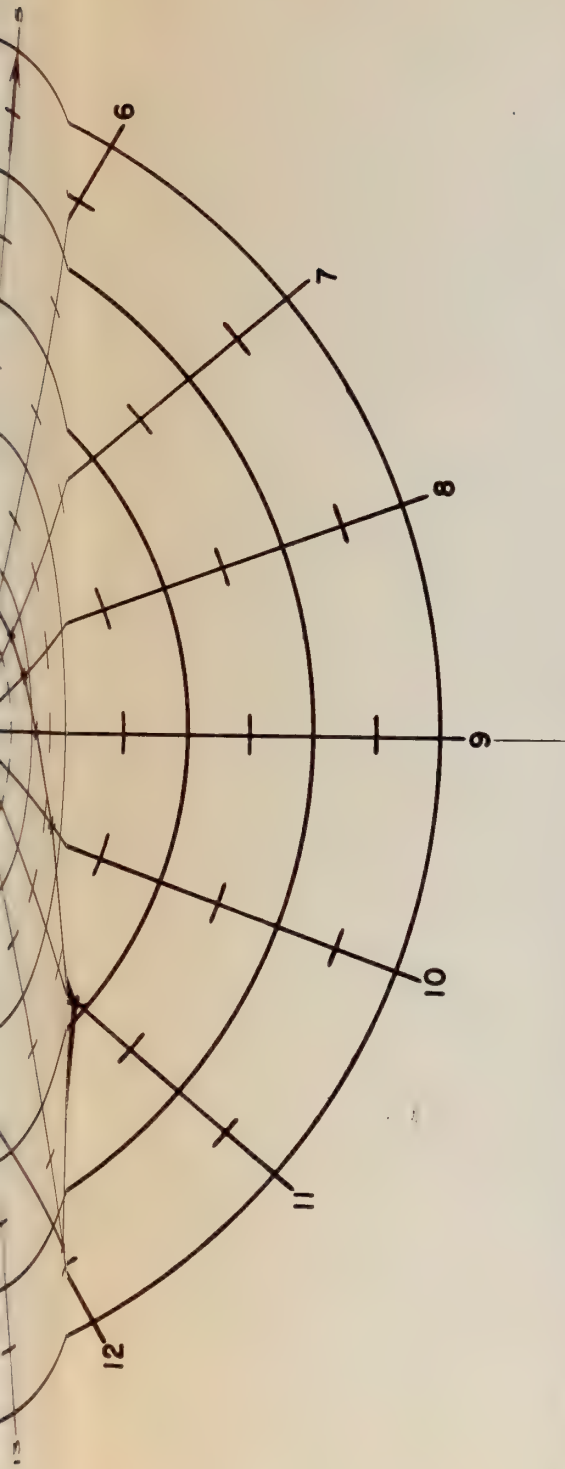
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3--SHORT STRING PERFORATED 1177-1187 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





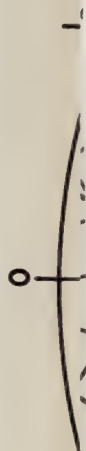
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

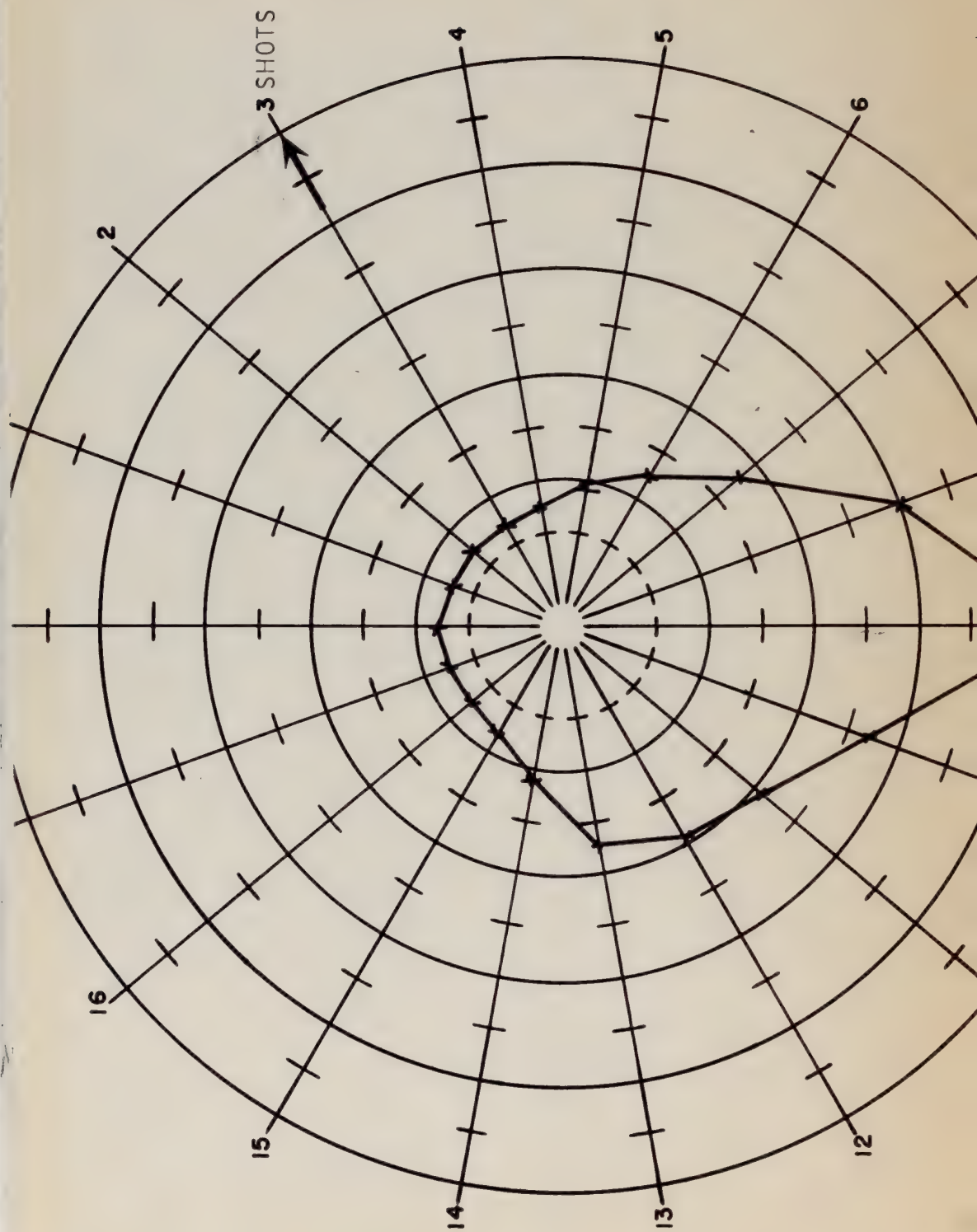
Schlumberger

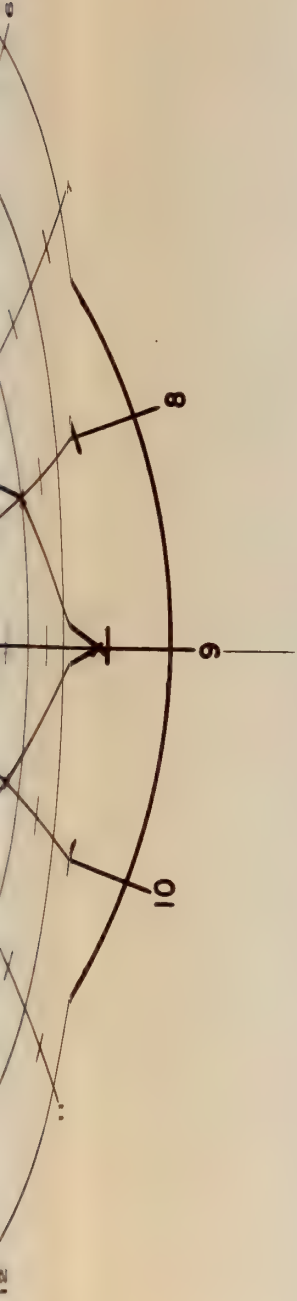
RADIOORIENTATION PLOT

POT-B

NO. 3-SHORT STRING PERFORATED 1166-1176 ONE SHOT PER FOOT WITH 1 1/16" HYPERDOME





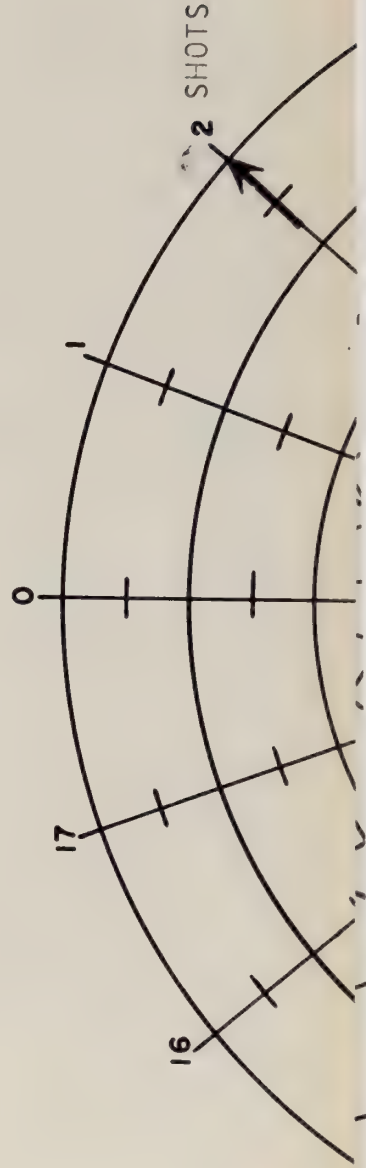


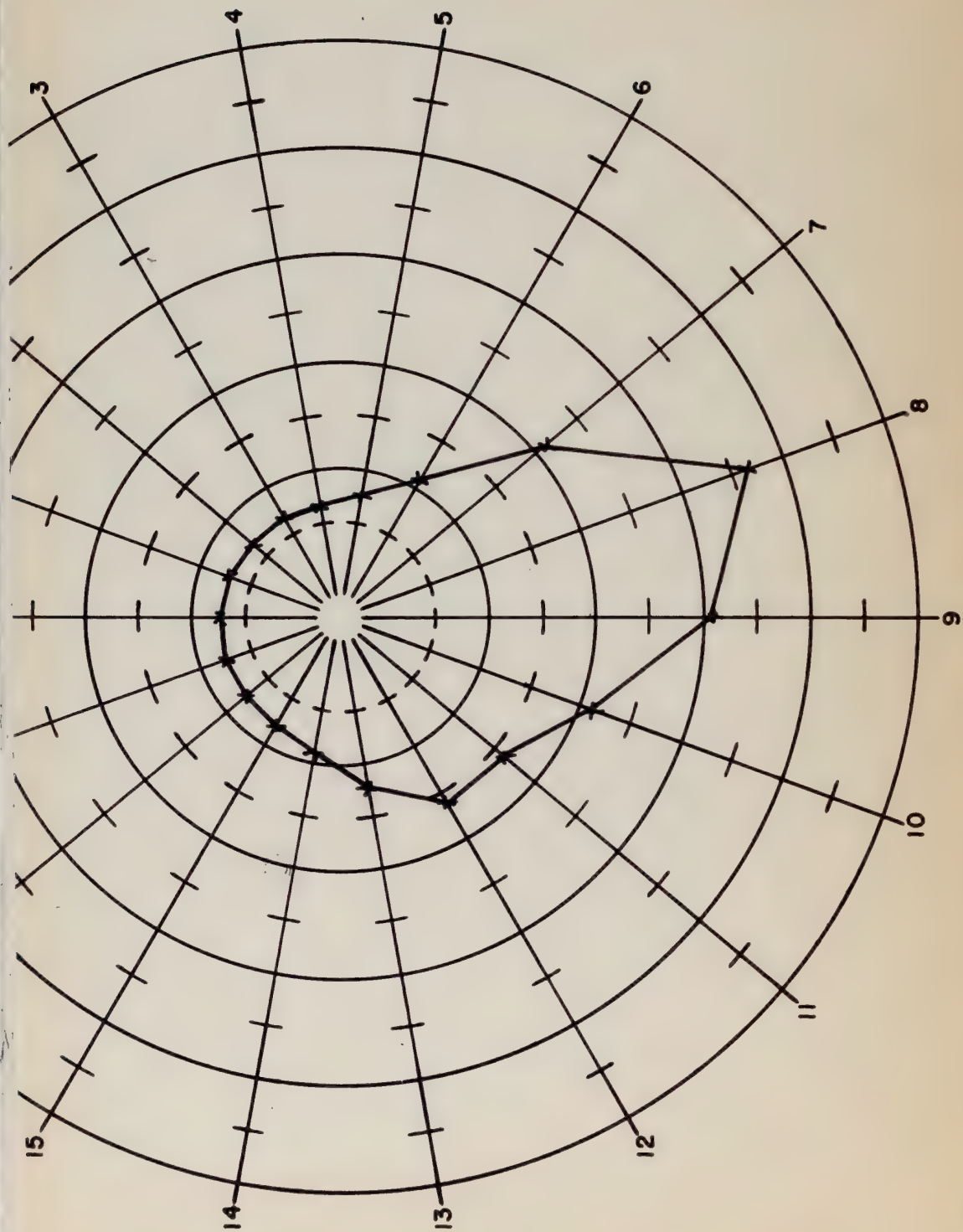
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIOORIENTATION PLOT

NO. 3-SHORT STRING PERFORATED 1155-1165 ^{POL-B} ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



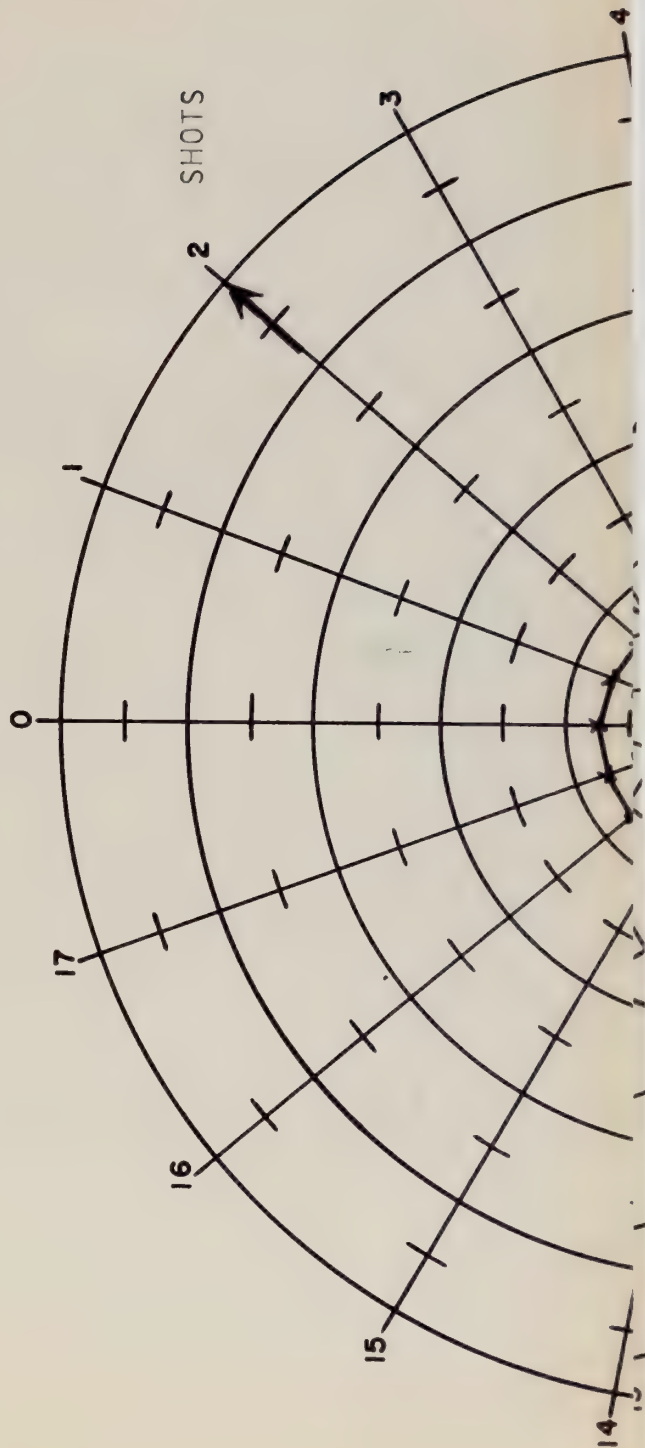


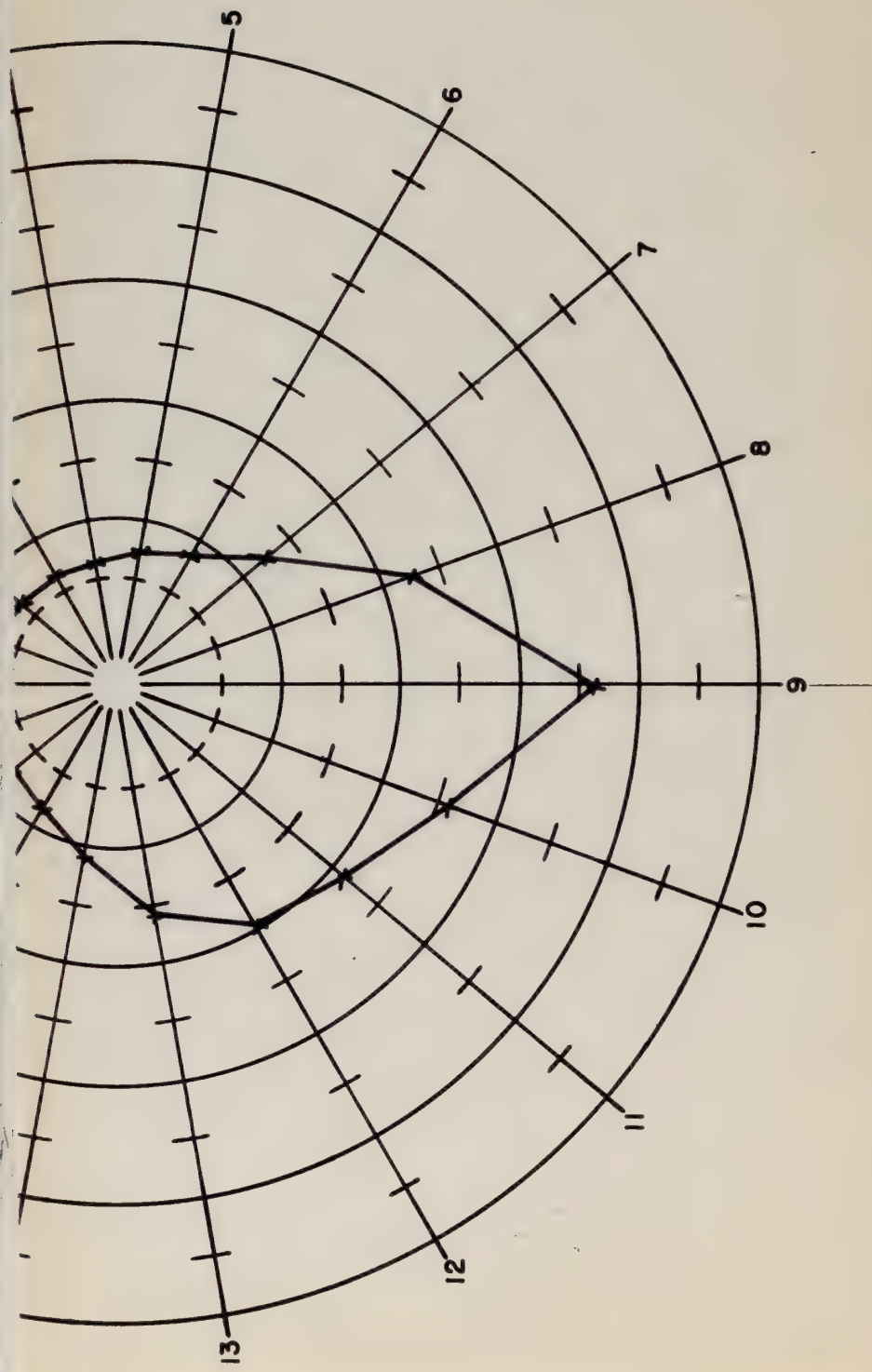
is are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

10.3-SHORT STRING PERFORATED 1144-1154 ONE SHOT PER FOOT WITH 1 1/16" HYPERDOME



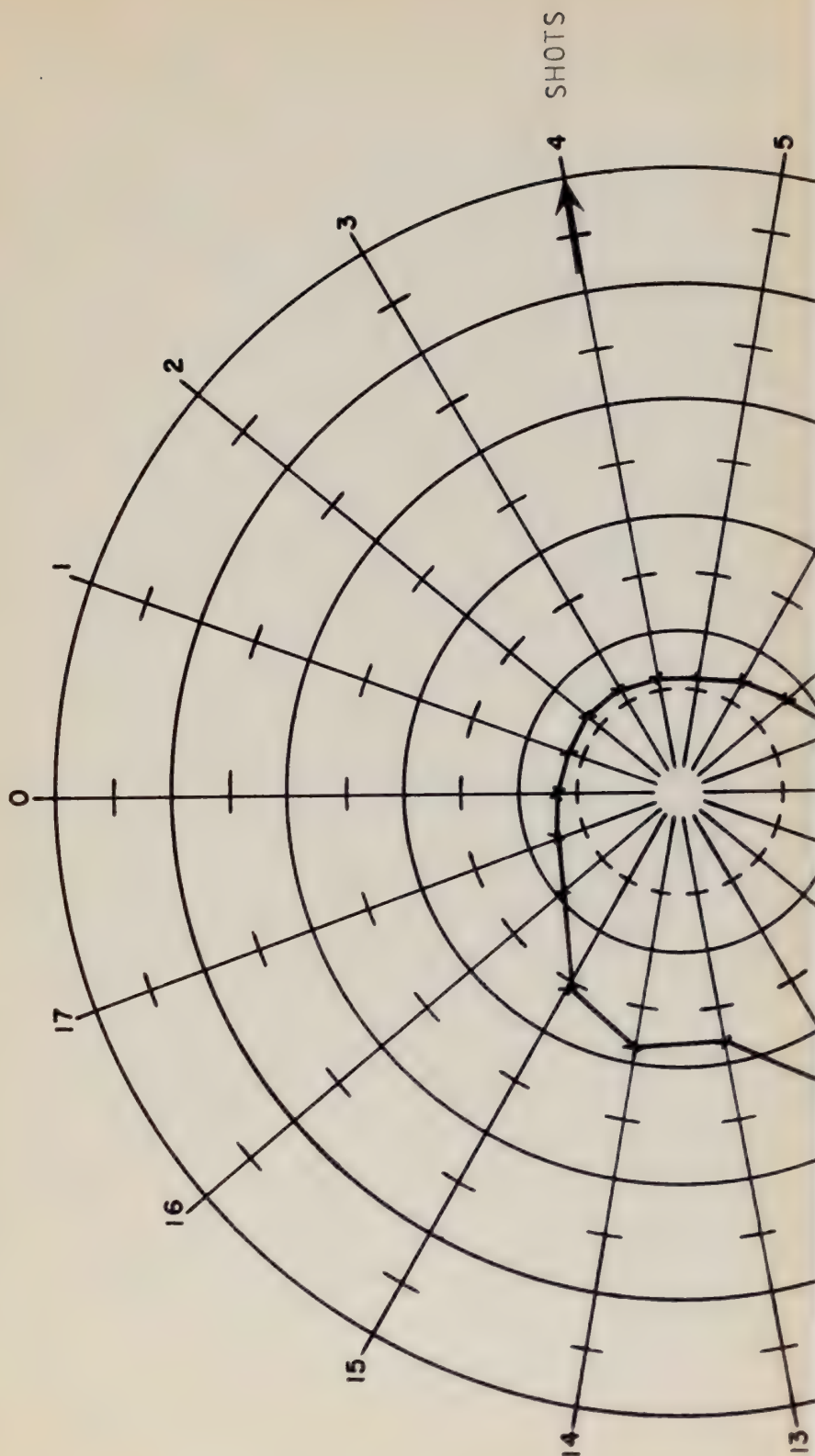


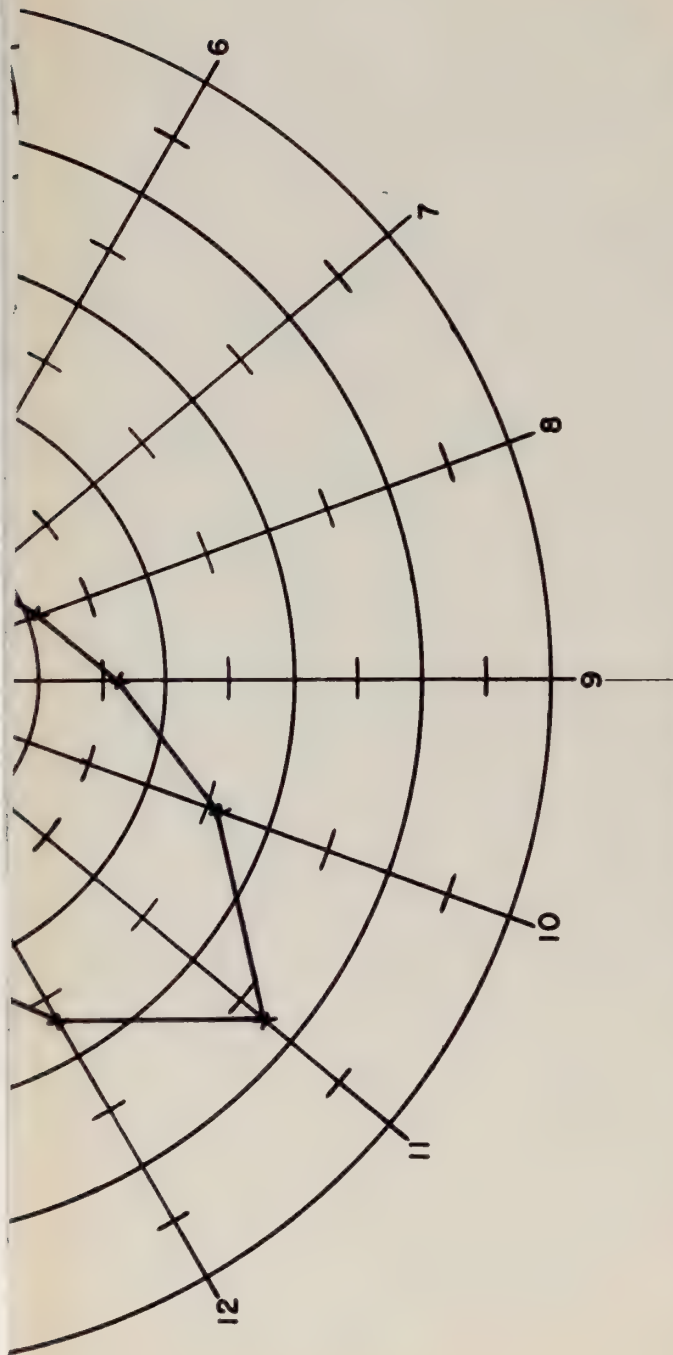
s chart, computation and/or interpretation of our readings from our gamma-gamma orientation and de-
 -fing instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
 are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
 e of our Service Order for this job. The readings could be adversely affected by vagrant metal in the
 ll hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

C.3-SHORT STRING PERFORATED 1133-1143 ONE SHOT PER FOLD WITH 1 11/16" HYPERDOME



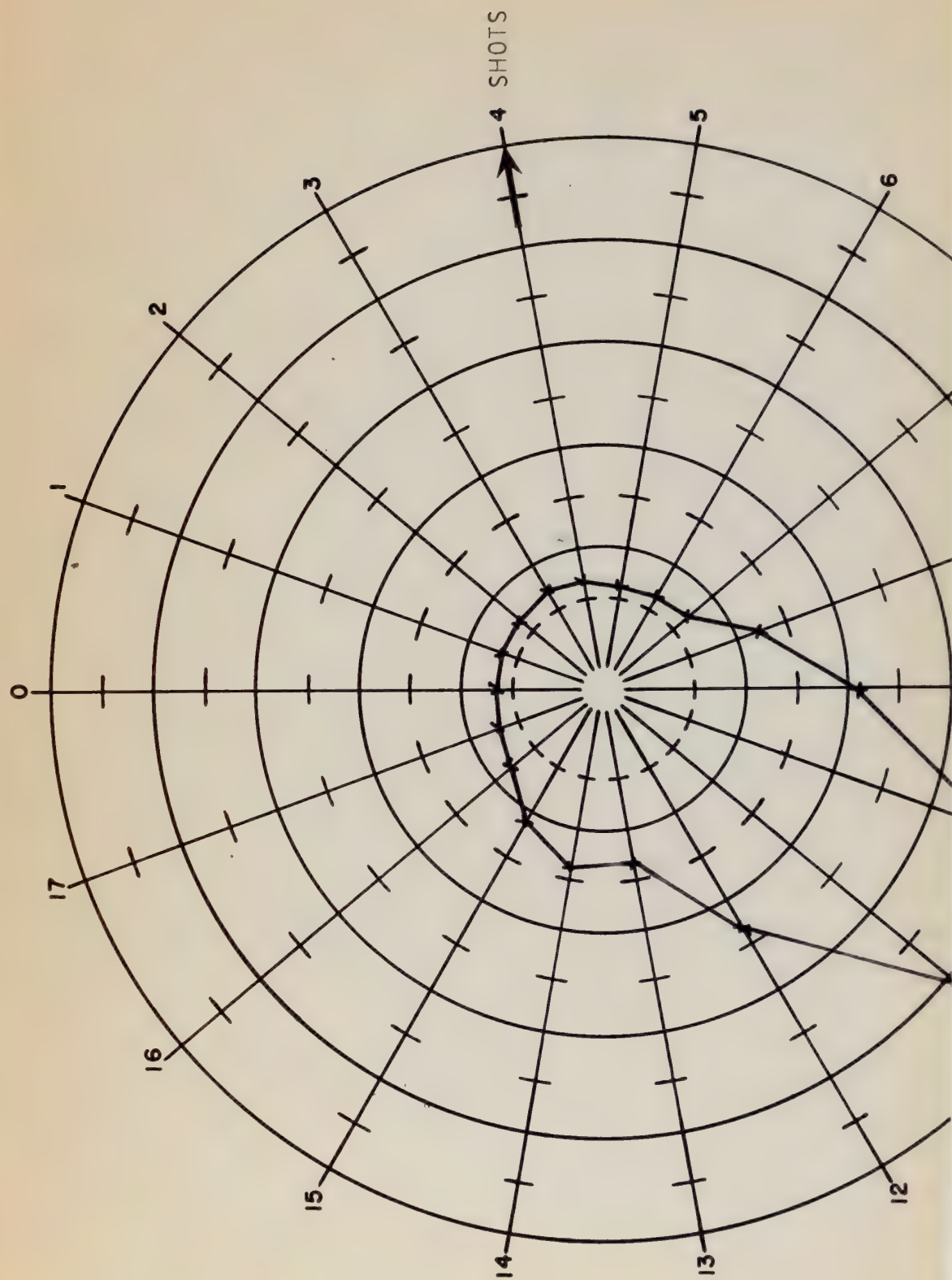


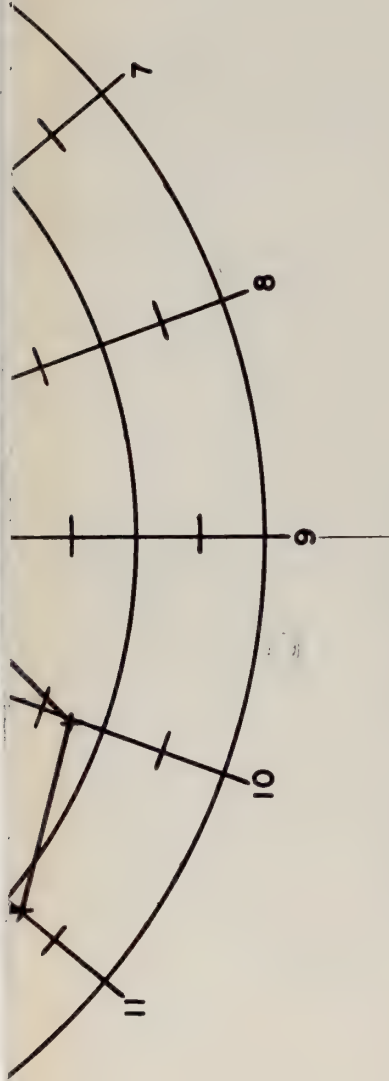
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

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RADIO-ORIENTATION PILOT

RADIO-ORIENTATION PLOT





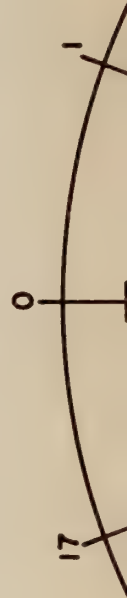
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

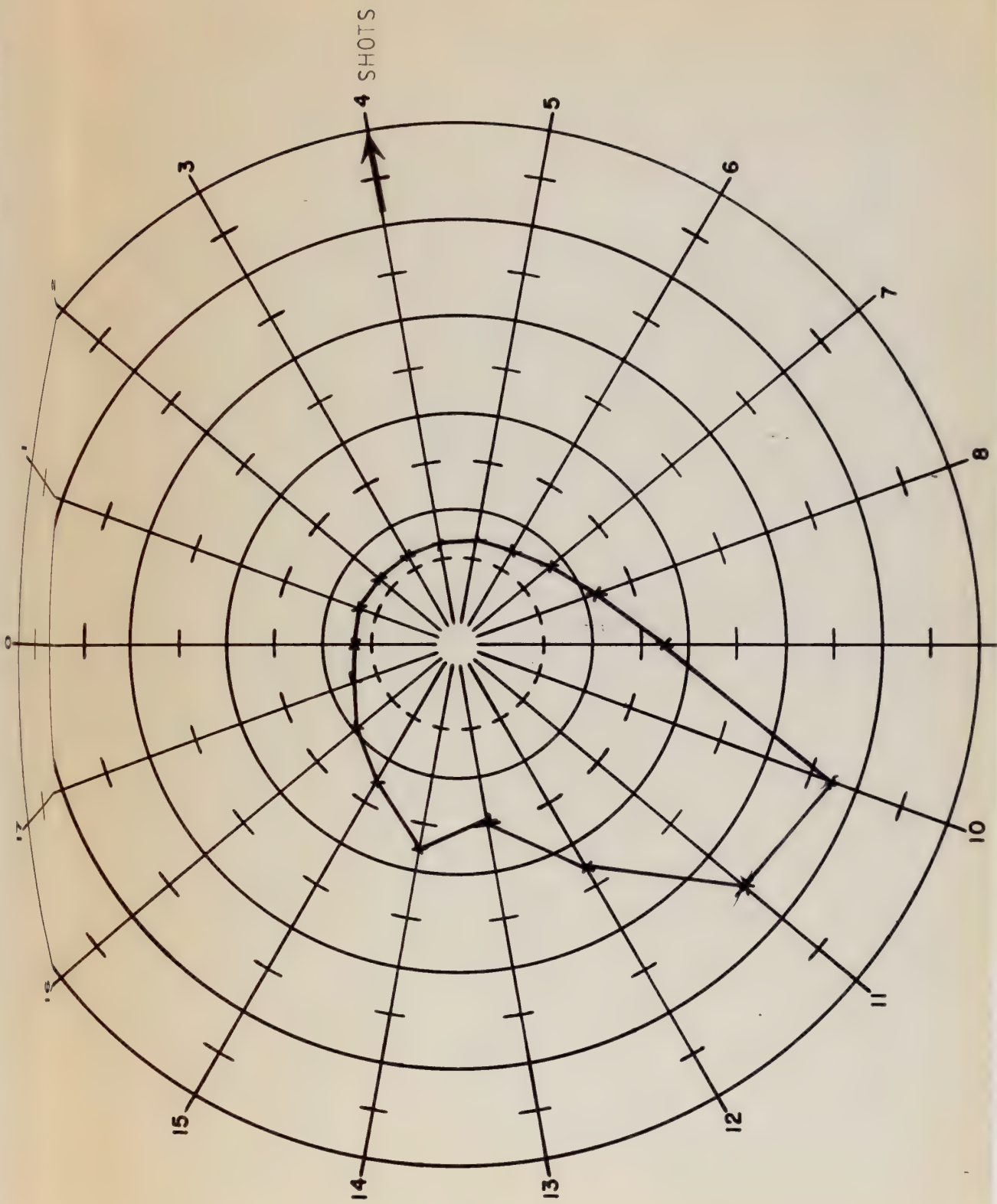
RADIOORIENTATION PLOT

POT-B

NO. 3 SHORT STRING PERFORATED 1111-1121 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



1000



This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

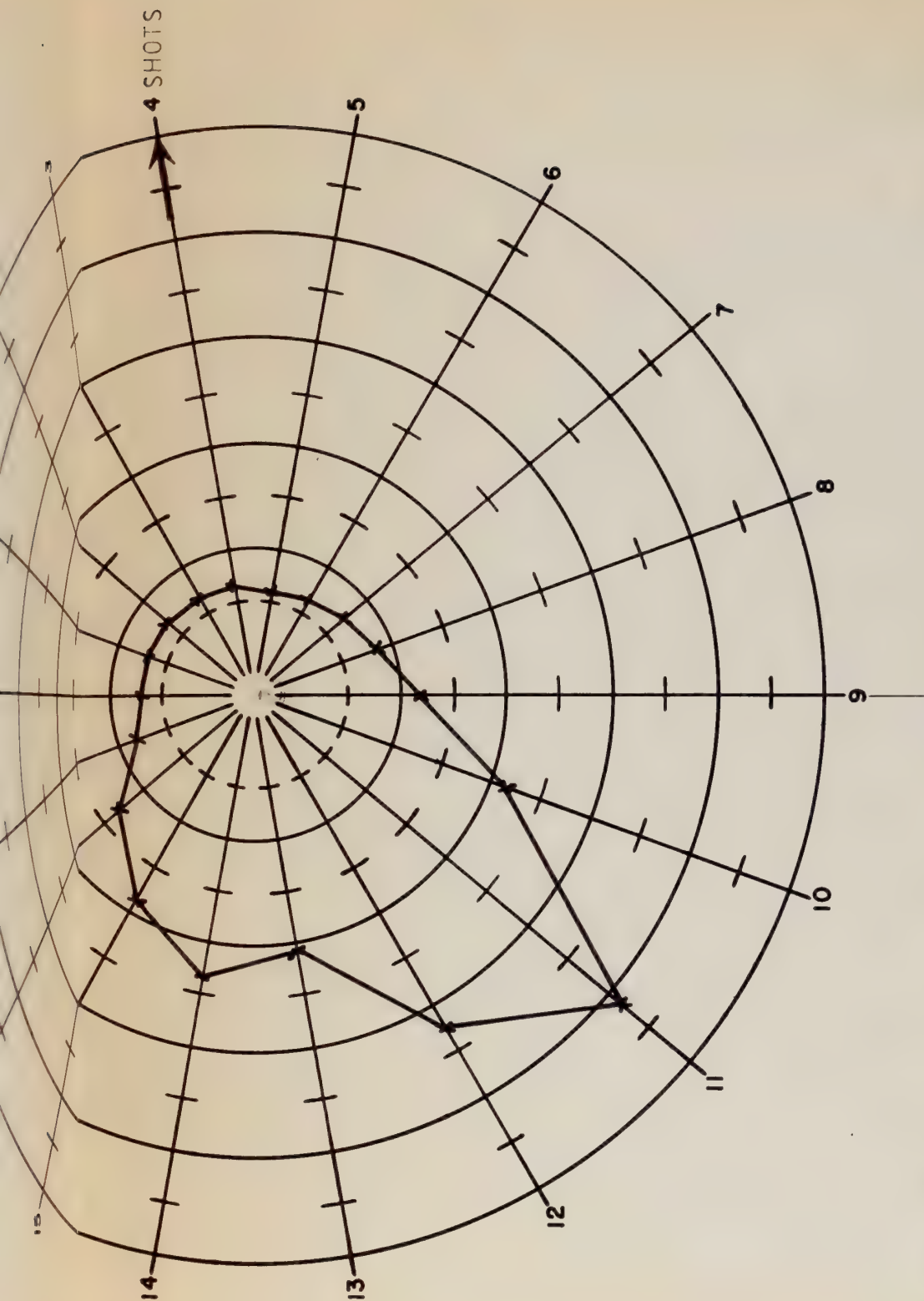
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO.3-SHORT STRING PERFORATED 1100-1110 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

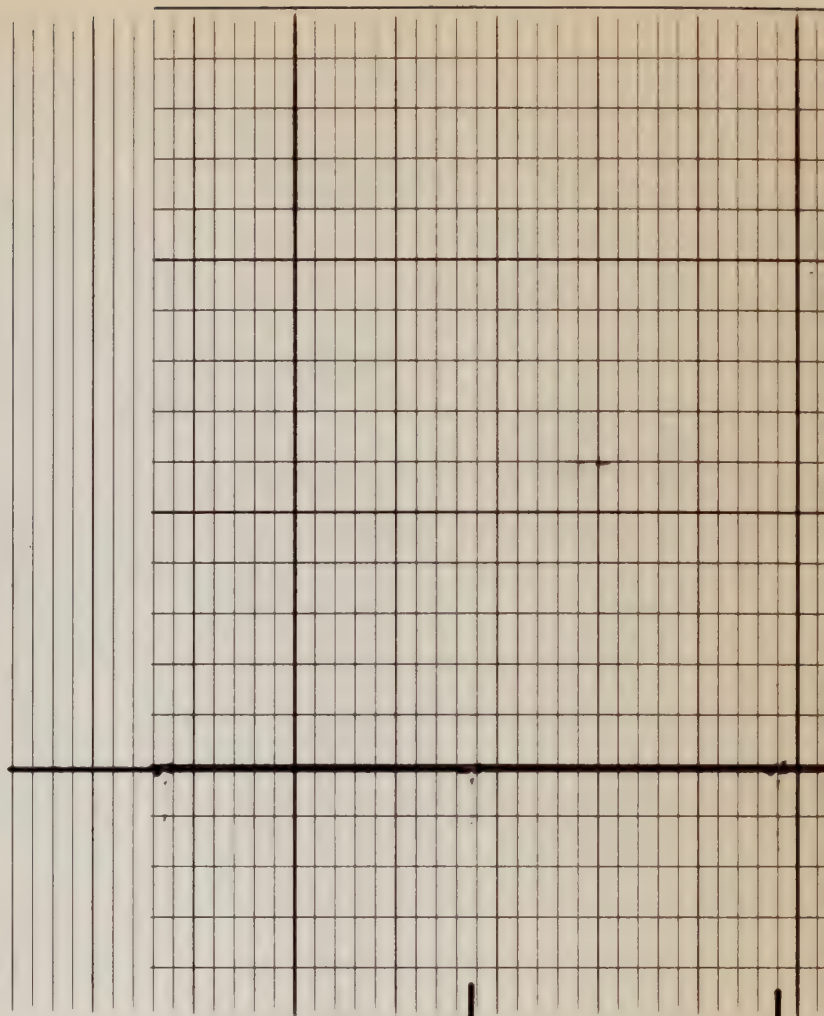




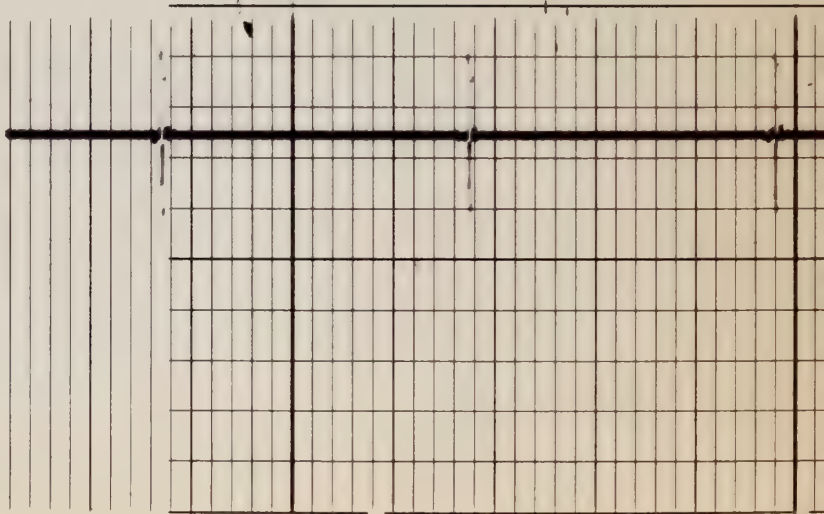
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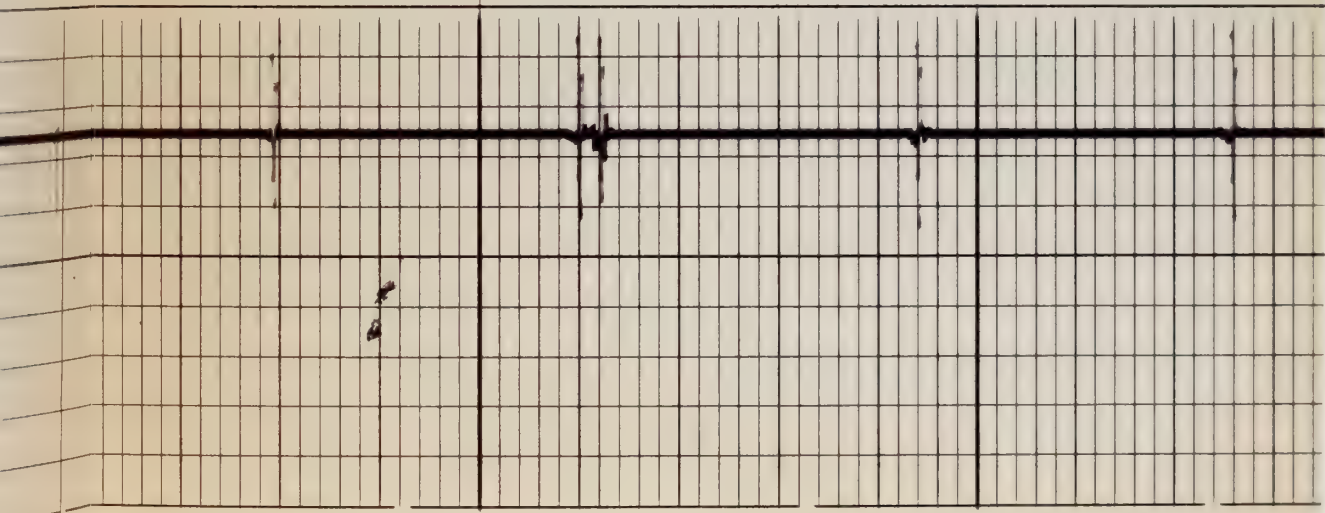
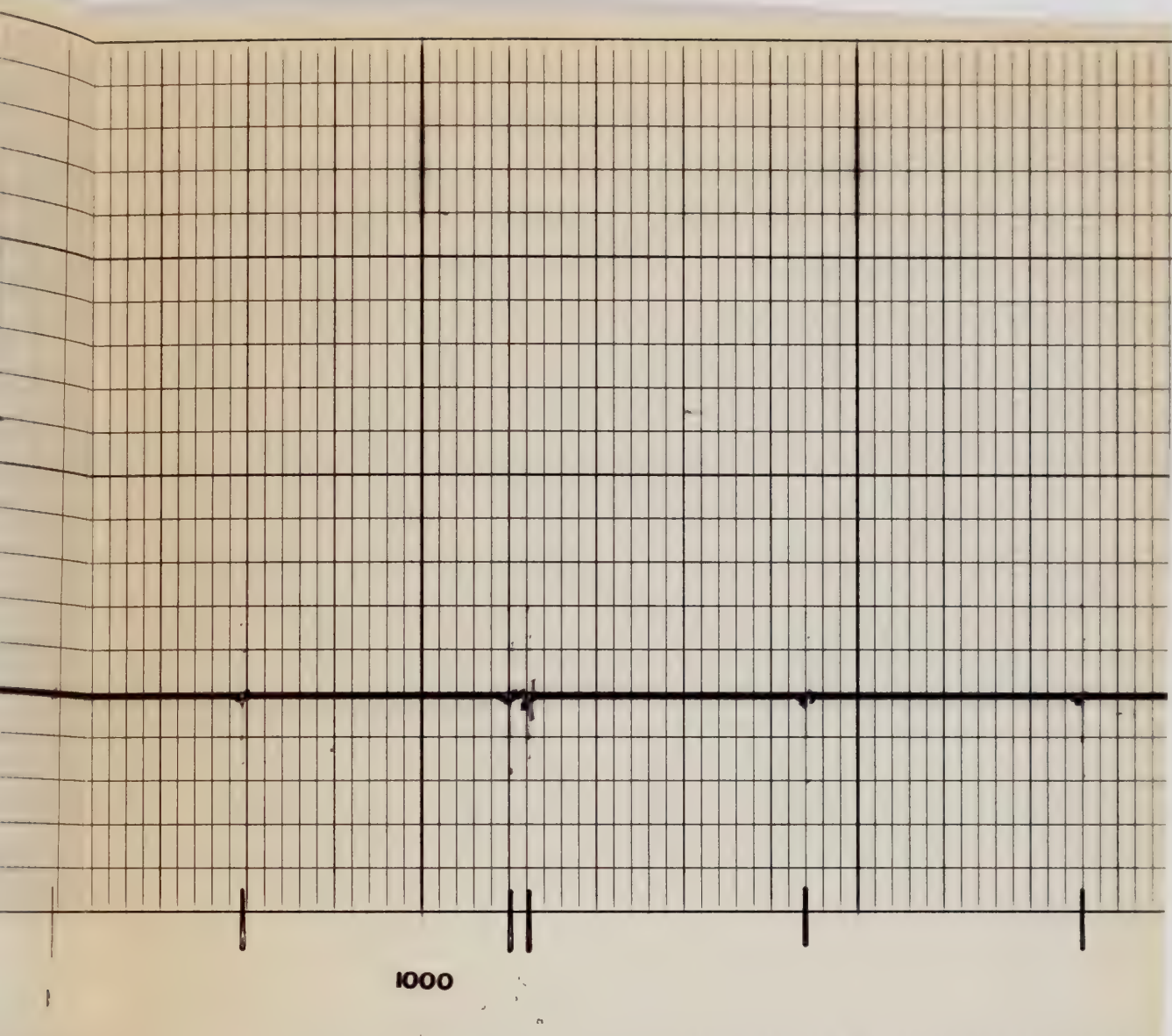
Schlumberger

NO. 3-SHORT STRING COLLAR LOG RUN
AFTER PERFORATING



0900

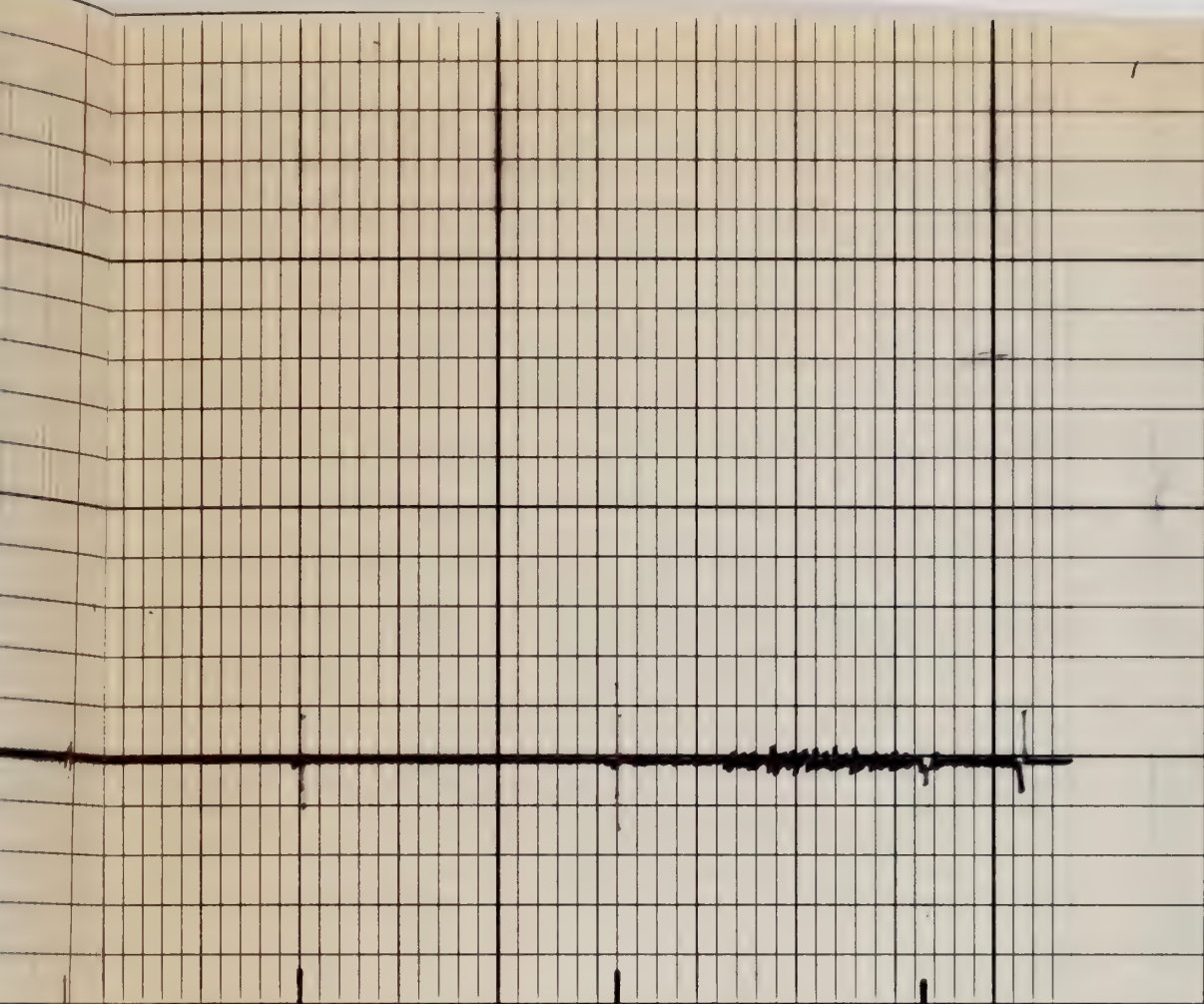




INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH 1 11/16"
HYPERDOME

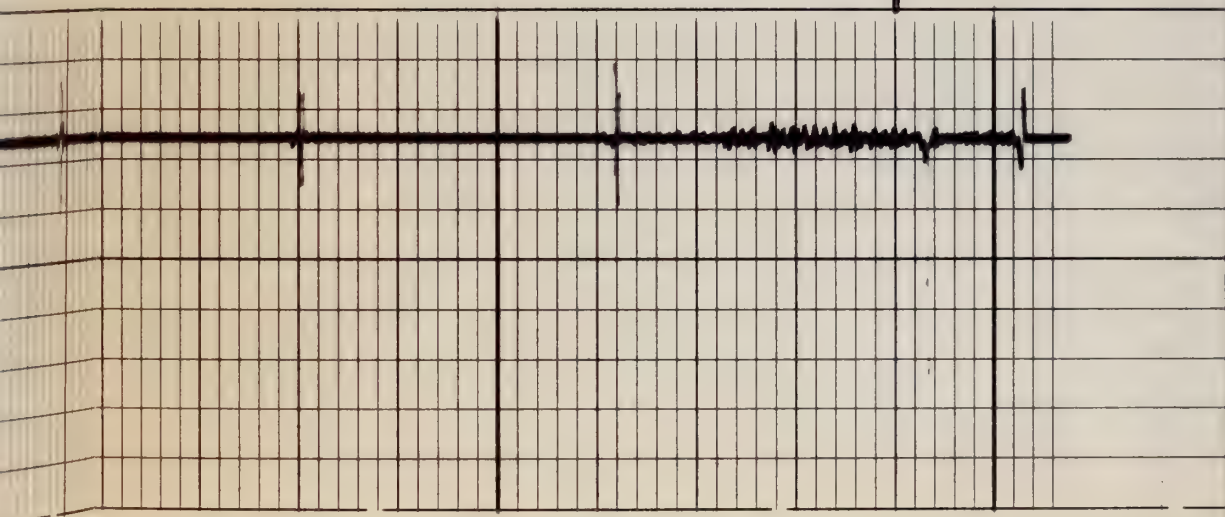
1100

1200



200

300



COMPANY ATLANTIC RICHFIELD COMPANY

WELL S.G. NO. 11

FIELD SORGHUM GULCH

RIO BLANCO, COLORADO

Schlumberger

PRODUCTION LOGGING SERVICES

Schlumberger

CEMENT BOND LOG

VDL-CCL

COUNTY RIO BLANCO
 Field or LOCATION SORGHUM GULCH
 WELL S.G. NO. 17
 COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL S.G. NO. 17

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION 436' FWL & 181' FSL API Serial No. _____

Other Services:
PDC-GR
ORP-HD

Sec. 16 Twp. 3S Rge. 46W

Permanent Datum: GROUND LEVEL, Elev. 7036
 Log Measured From GL, 0 Ft. Above Perm. Datum
 Drilling Measured From GL

Elev.: K.B. ----
 D.F. ----
 G.L. 7036

Date	<u>2-21-75</u>	Type Drill Fluid	<u>WATER</u>
Run No.	<u>ONE</u>	Fluid Level	<u>FULL</u>
Depth — Driller	<u>2305-1490</u>	Max. Rec. Temp.	<u>----</u> °F
Depth — Logger	<u>2285-1503</u>	Est. Cement Top	<u>1110</u>
Btm. Log Interval	<u>2277-1435</u>	Equip. Location	<u>3862 VERNAL</u>
Top Log Interval	<u>0900-0900</u>	Recorded By	<u>ST. AUBYN</u>
Open Hole Size	<u>6 3/4</u>	Witnessed By	<u>MR. DON TAIT</u>

CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String	<u>8 5/8</u>	<u>24</u>		<u>T & C</u>	<u>SURF</u>	<u>63</u>
String (1)	<u>2 3/8</u>	<u>4.7</u>		<u>T & C</u>	<u>SURF</u>	<u>2335</u>
String (2)	<u>2 3/8</u>	<u>4.7</u>		<u>T & C</u>	<u>SURF</u>	<u>1490</u>
Liner						

PRIMARY CEMENTING DATA

STRING	Surface	Protection	Production	Liner
Vol. of cement			<u>330 SKS</u>	
Type of cement			<u>HOWCO THIXOTROPER</u>	
Additive				
Retarder				
Wt. of slurry			<u>14.8#</u>	
Water loss			<u>----</u>	
Type fluid in csg.			<u>WATER</u>	
Fluid wt.			<u>----</u>	

The well name, location and borehole reference data were furnished by the customer.

END HERE

PRIMARY CEMENTING PROCEDURE			REMARKS	
	Hour — date	Hours from start of operation	Service Order No. 51317	
Started pumping cement	17:30 1-07-75		Csg. Collars Recorded 15 ft. DEEP	
Release pressure	18:45 1-07-75			
Start Cement Bond Log	20:00 2-21-75			
Finish Cement Bond Log	24:00 2-21-75			
Preceding fluid	Volume _____ bbls.	Pipe reciprocated during Pumping: Yes <input checked="" type="checkbox"/> No _____		
Cement pumped	bbls./minute _____	Pipe reciprocated after plug down: Yes _____ min., No <input checked="" type="checkbox"/> _____		

SQUEEZE JOB DETAIL				EQUIPMENT DATA	Centralizer Depths	Scratcher Depths
Squeeze number	1	2		Sonic Panel No.	SLP-FH# 561	
Date				Sonic Cart No.	SHH-AKA# 34	
Depth interval				Sonic Sonde No.	SLS-JC# 32	
Type cement				CRP No.	14	
Volume of cement				Mem Panel No.	---	
Additive				GR Panel No.	---	
				GR Cart No.	---	
Retarder				Centralizer: Type	CME-V CAL-AJ#78	
				No.	CME-W	
Weight of slurry				To Level (MV)	100	
Preceding fluid				Cart. Gain	45	
				CRP Intensity	.21	
Breakdown pressure				R9G Intensity	8	
Max. pressure-stage 1						
" " 2						
" " 3						
Final maximum pressure				Logging Speed	30 FPM	
				Time Constant		
Started pumping cement						
Released pressure						
Start CBL						
Finish CBL						
AVERAGE WELL DRIFT:						
° from	to	° from	to	° from	to	° from

MICROSECONDS 200 SPACING
400

MILLIVOLTS
0 100

MICROSECONDS 5 FT. SPACING
200 1200

DEPTH

CUT

NO. 1 LONG STRING

1 4 3 2 1

1 3 2 1

ΔI

Amplitude

Casing Collars

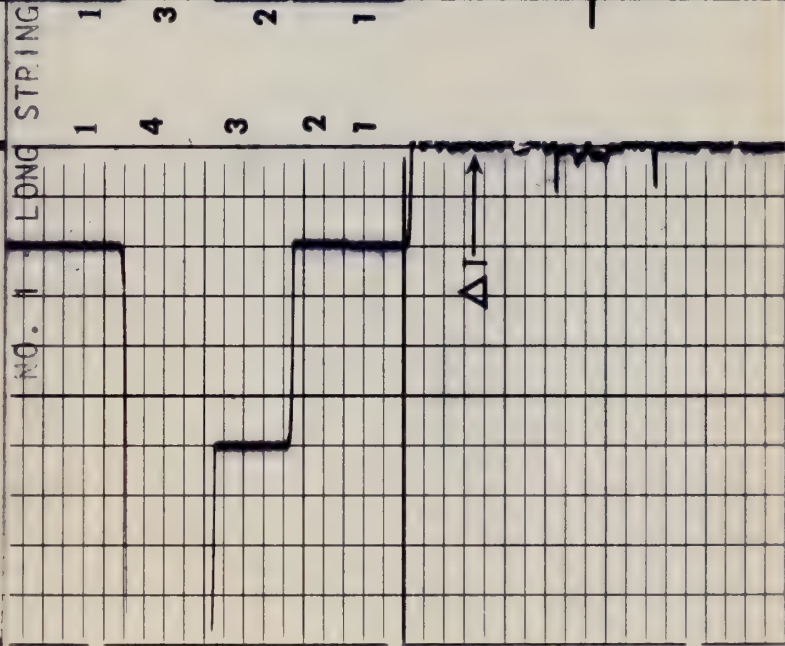
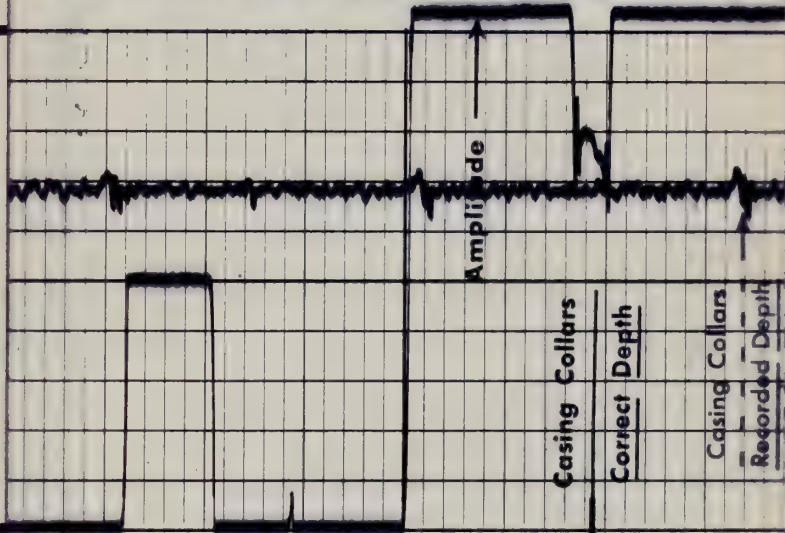
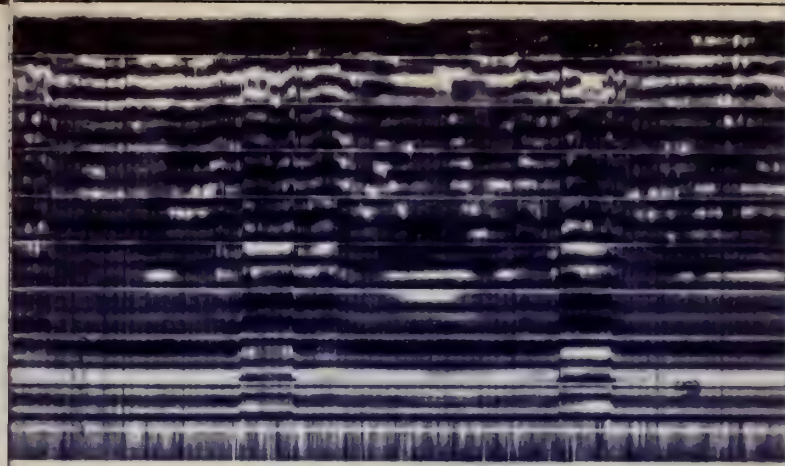
Correct Depth

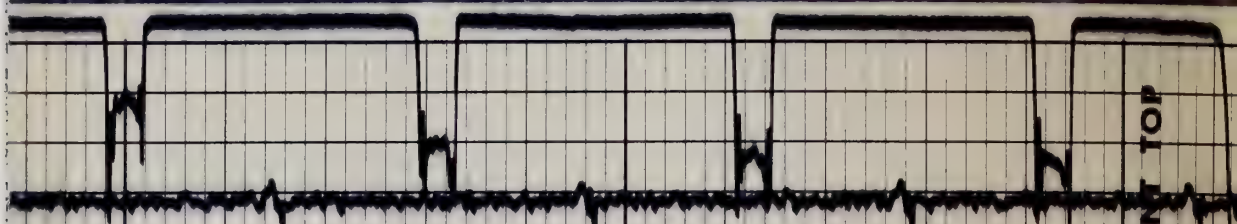
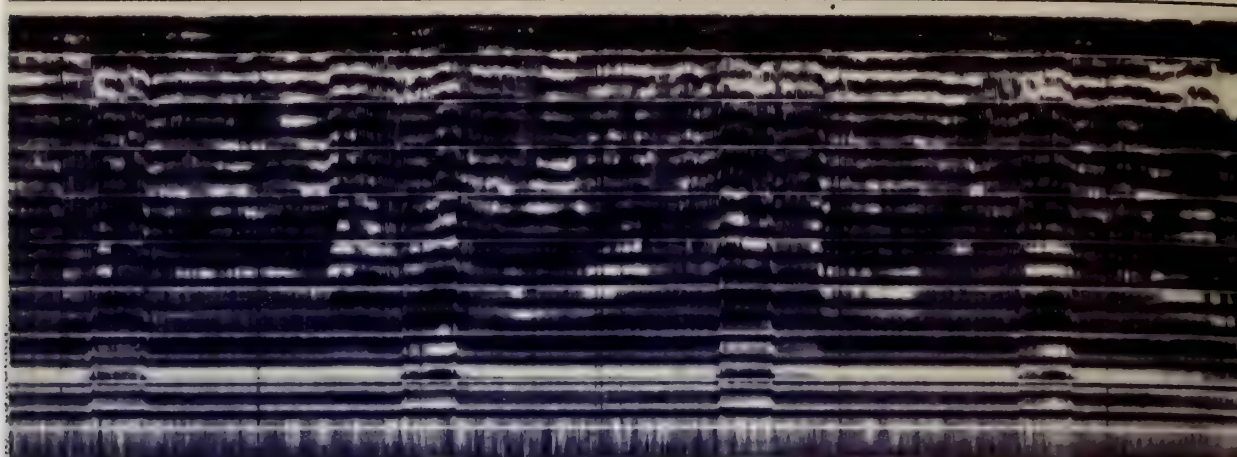
Casing Collars

Recorded Depth

Casing Collars

Corrected Depth



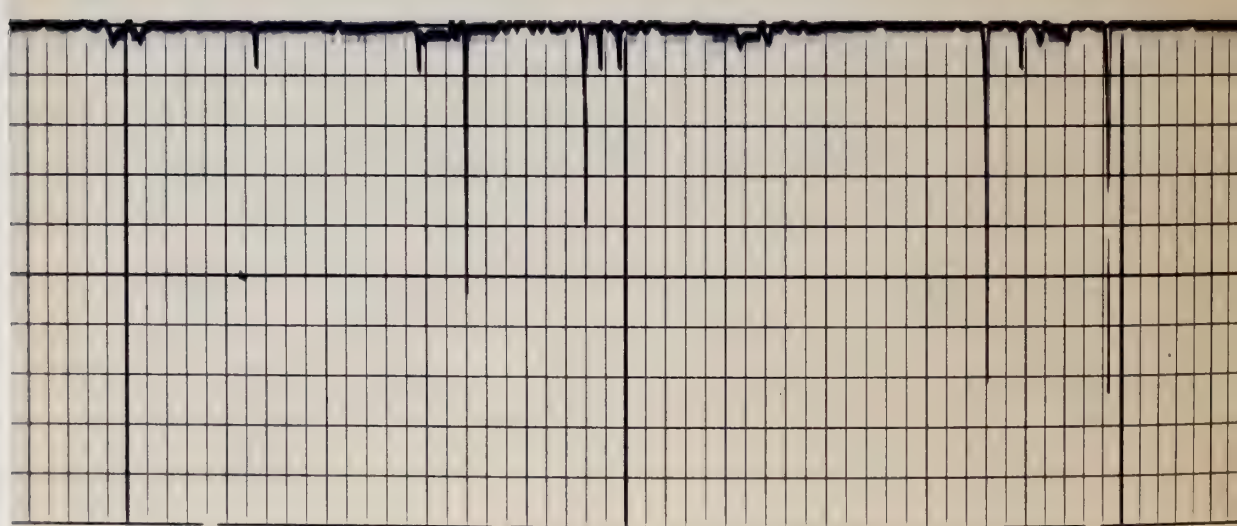


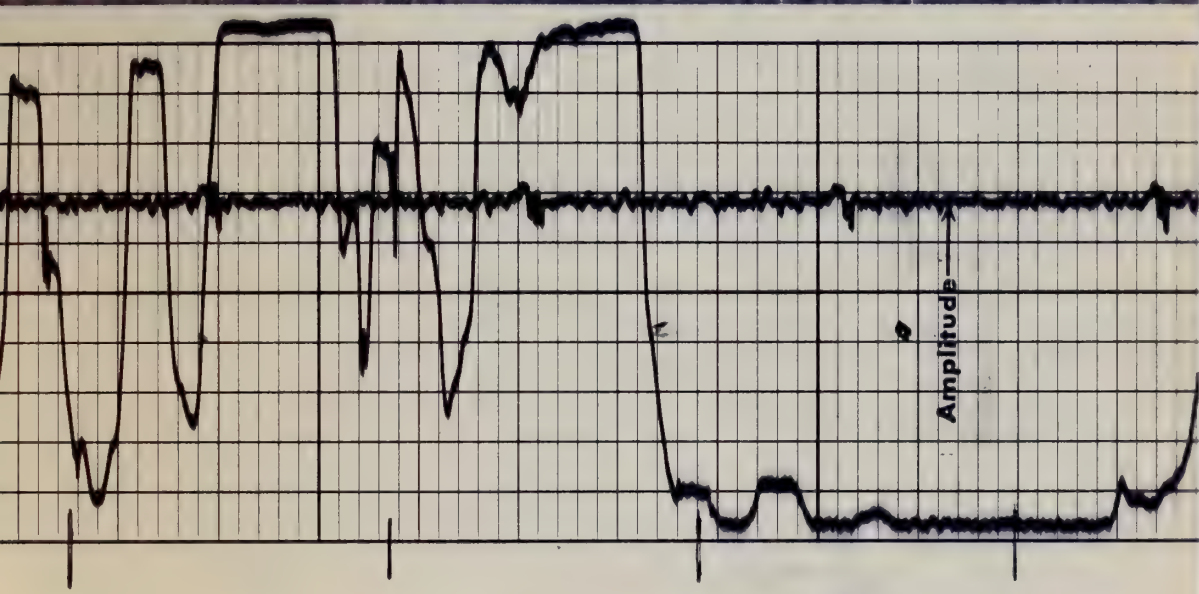
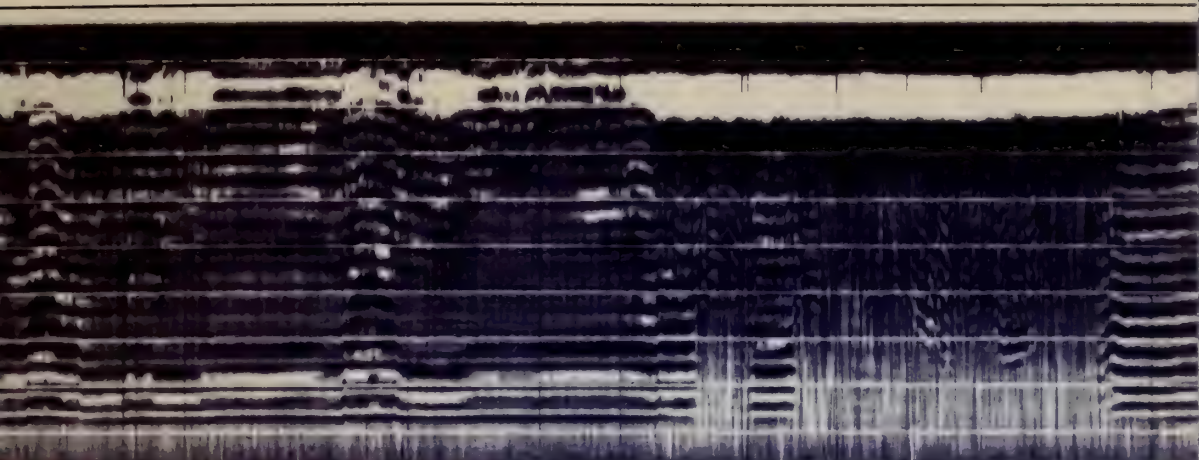
15' Deep

PROBABLE CEMENT TOP

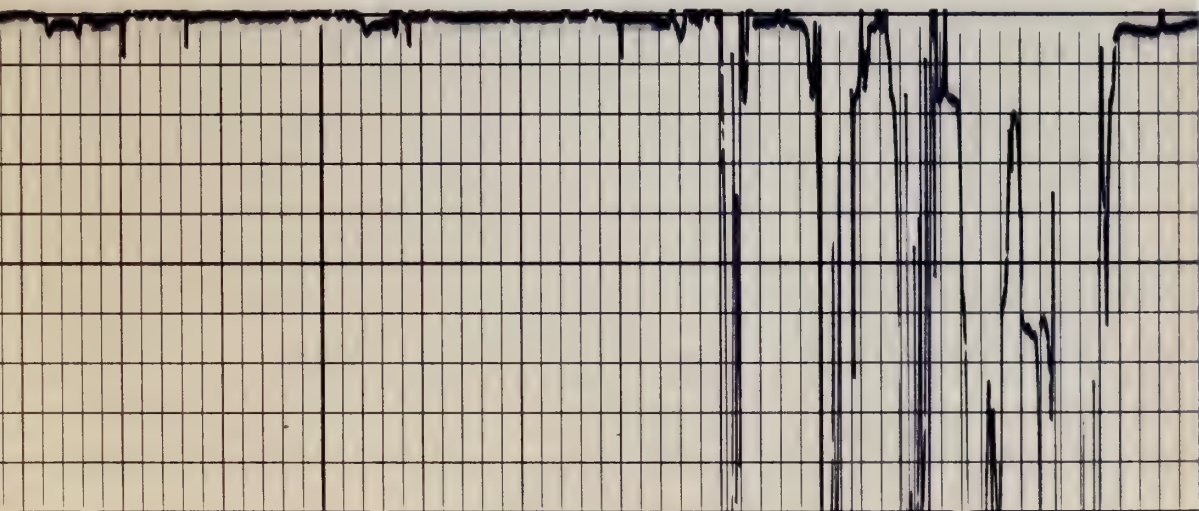
1000

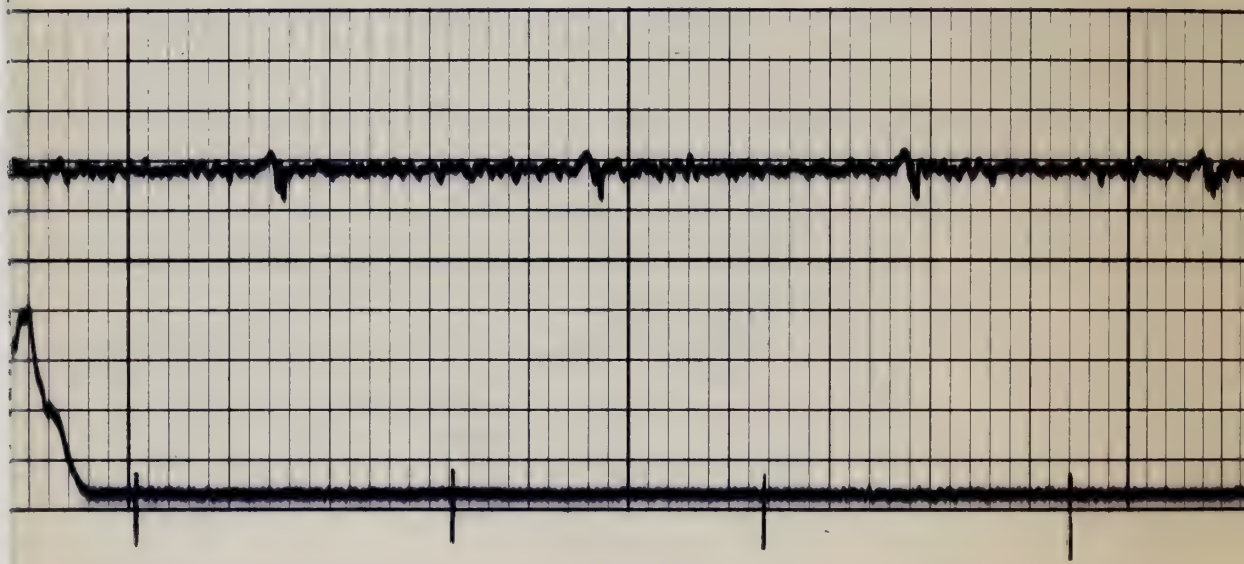
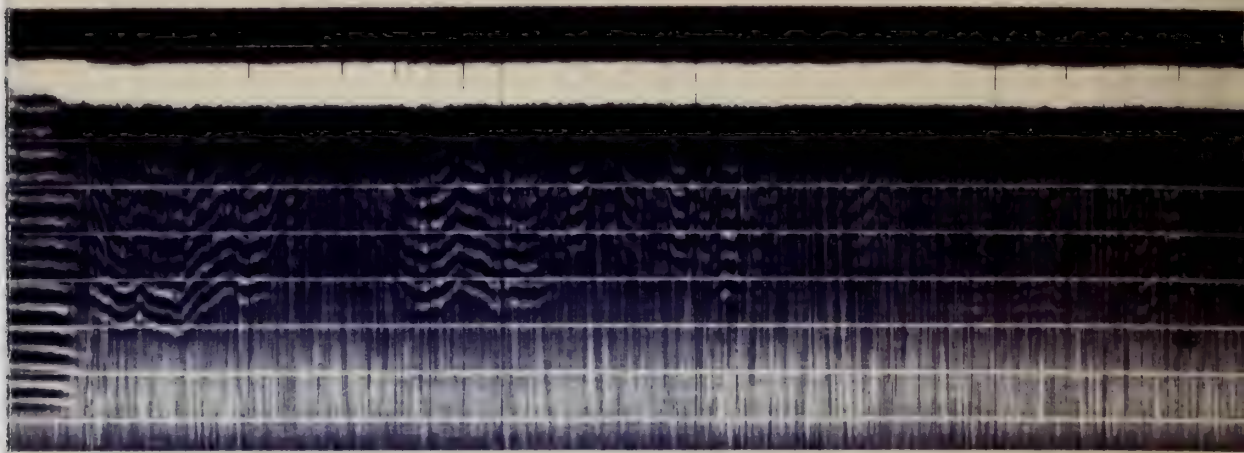
1100



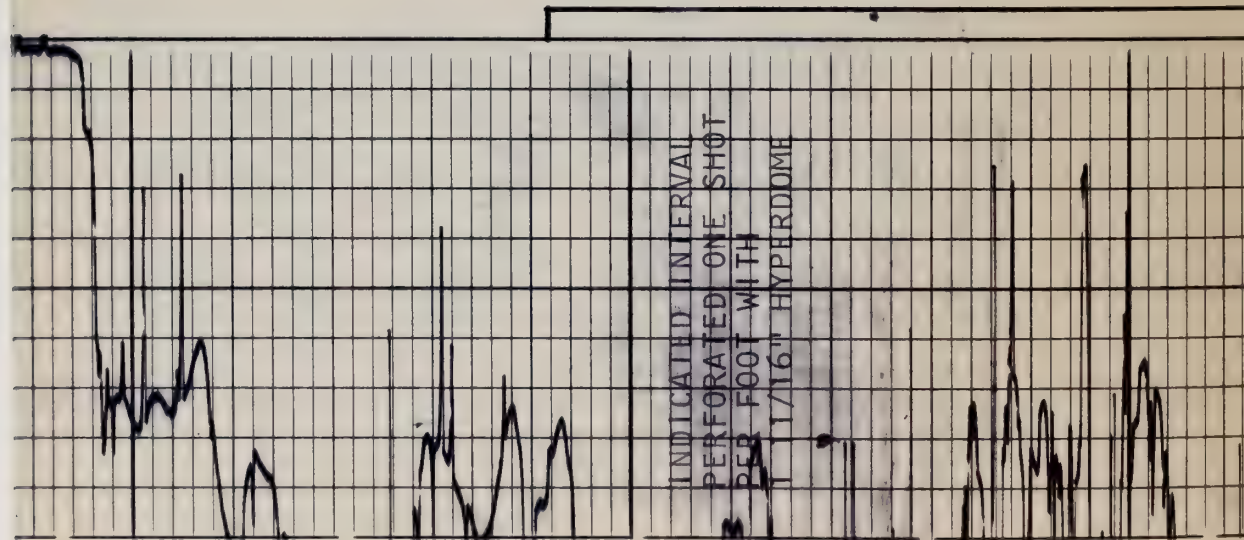


1200

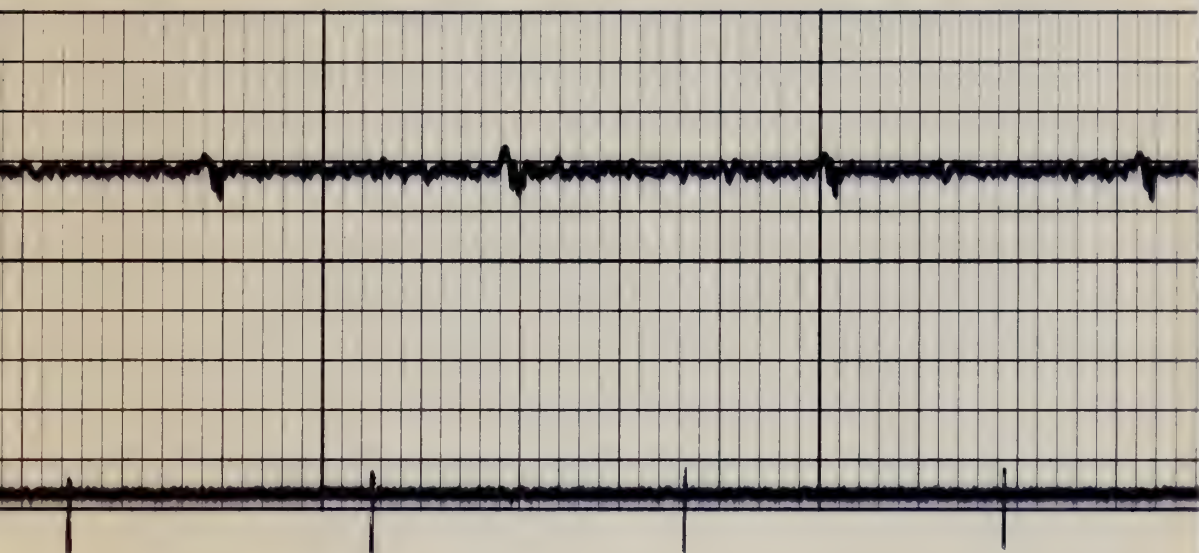
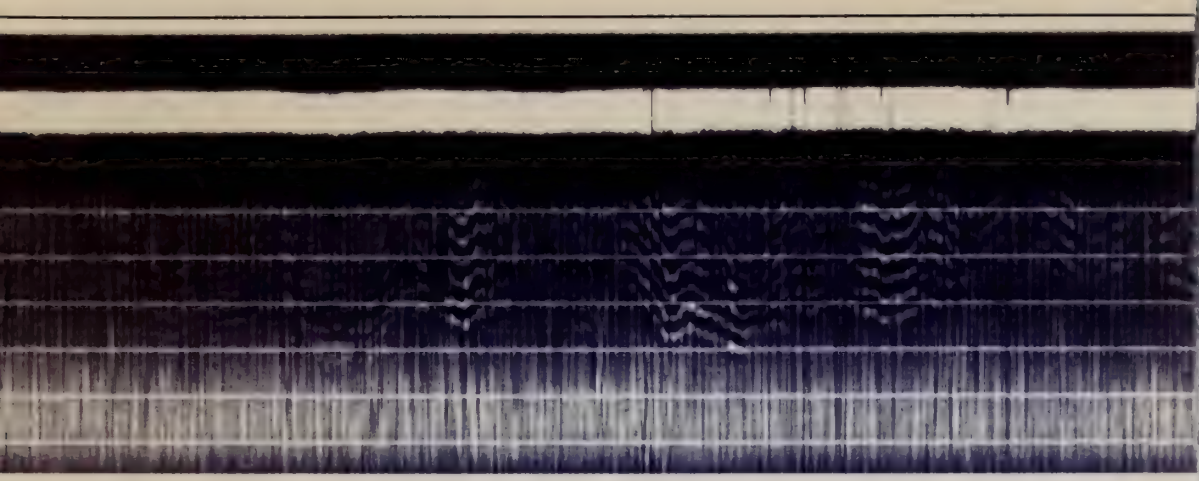




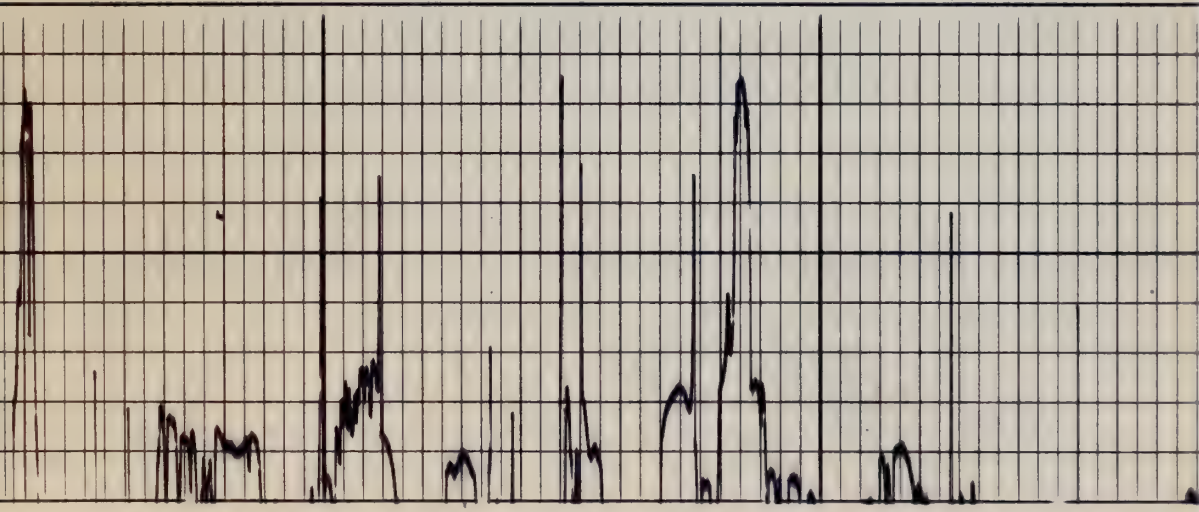
1300

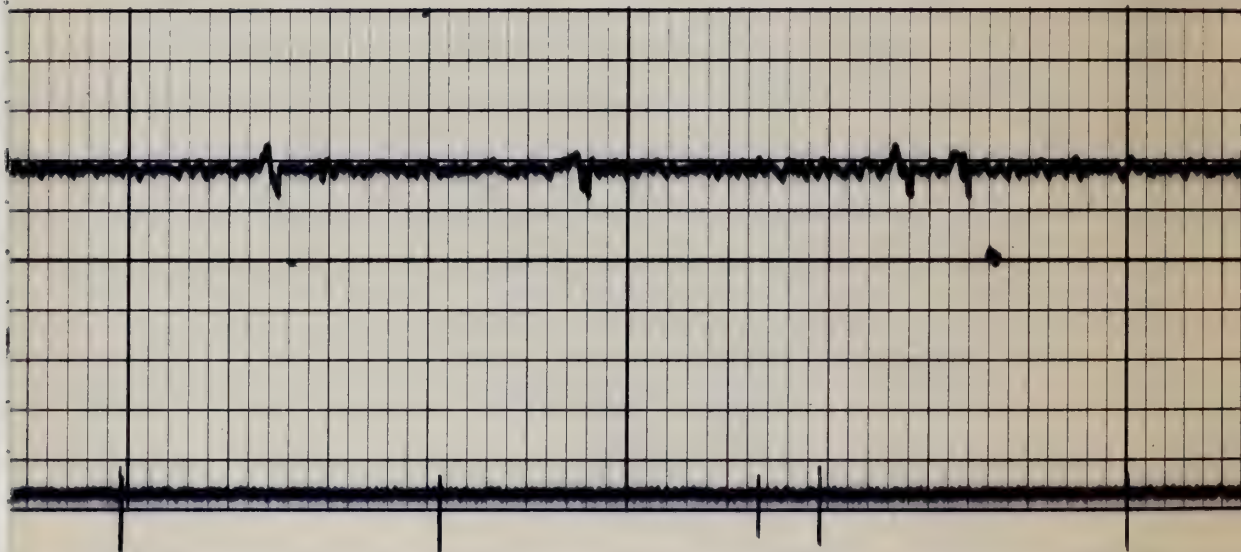
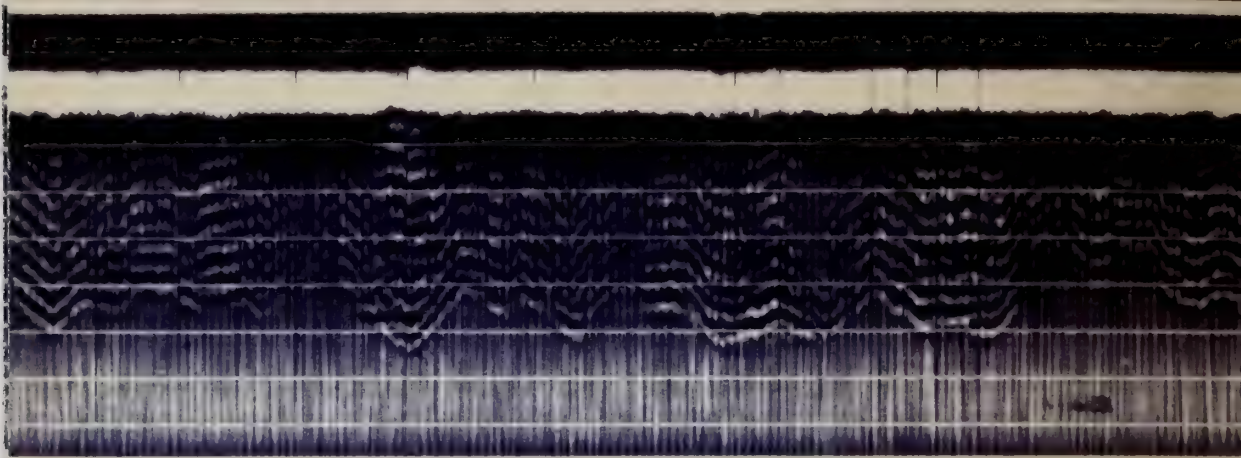


INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH
1 1/16" HYPERDOME



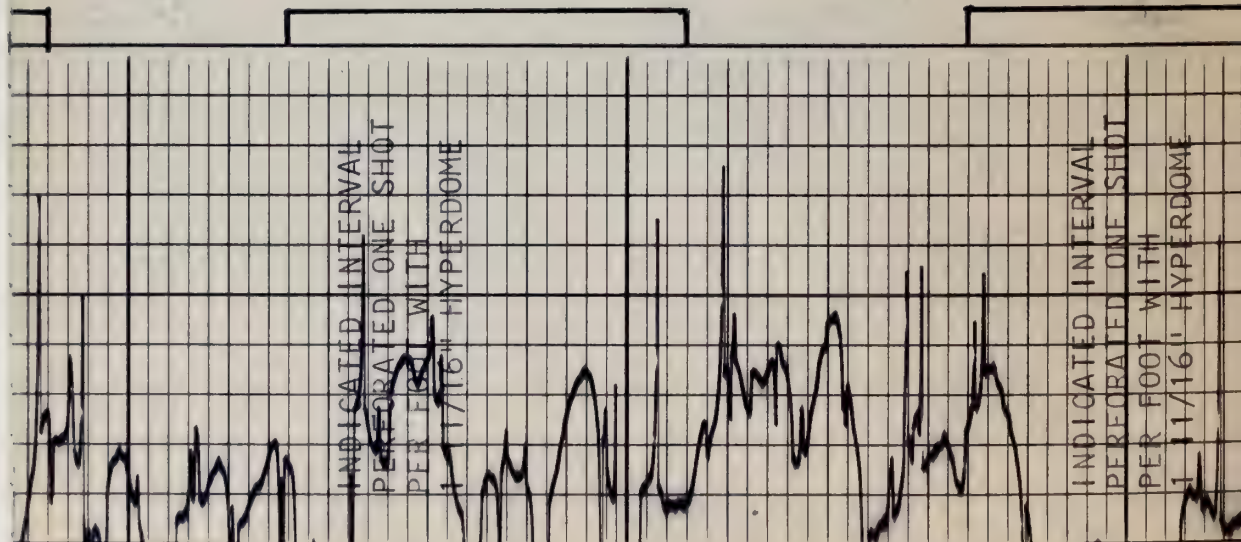
1400

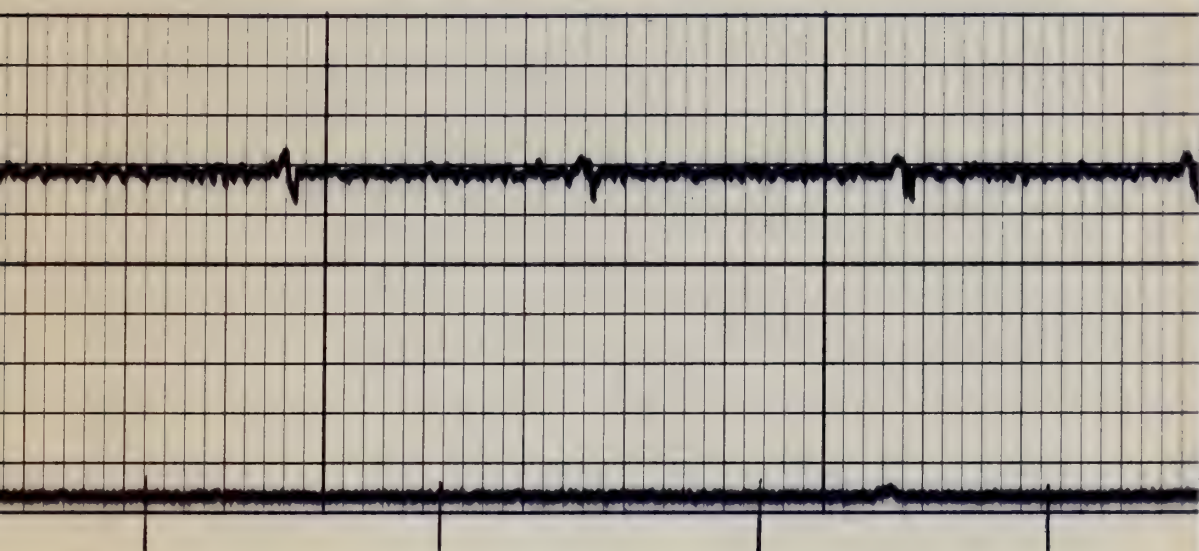
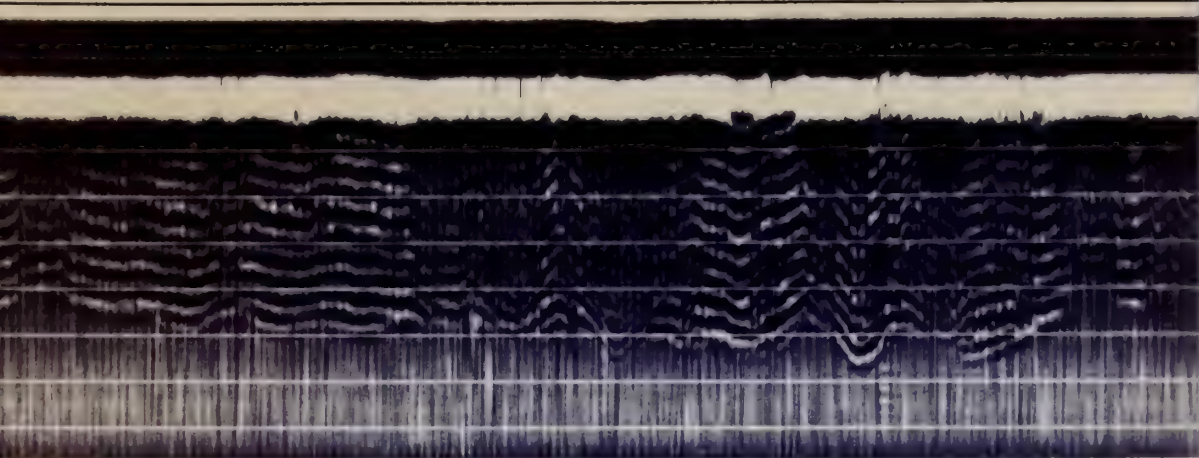




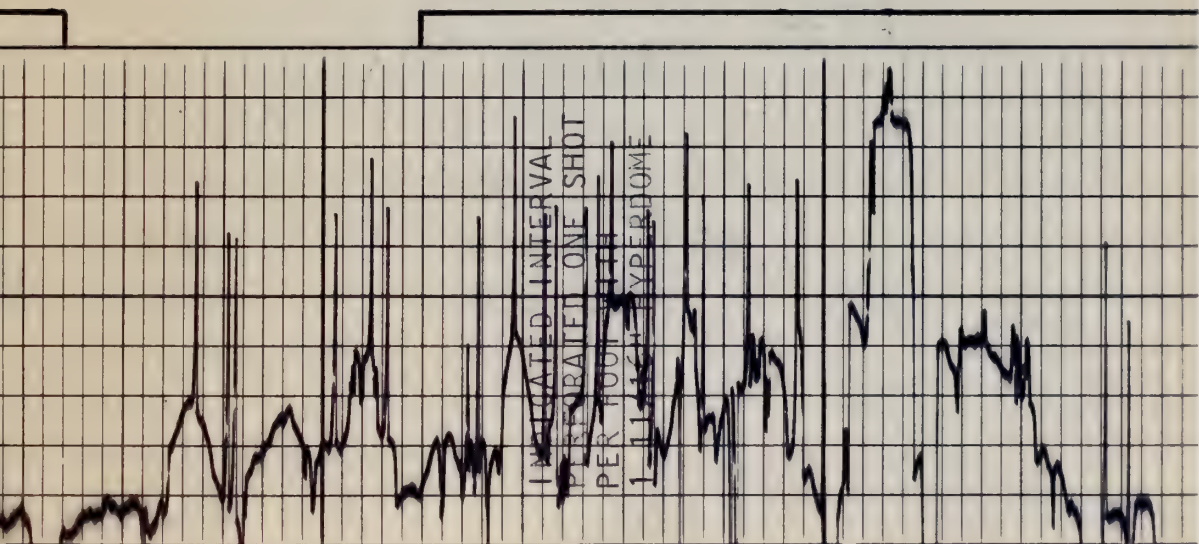
1500

1600

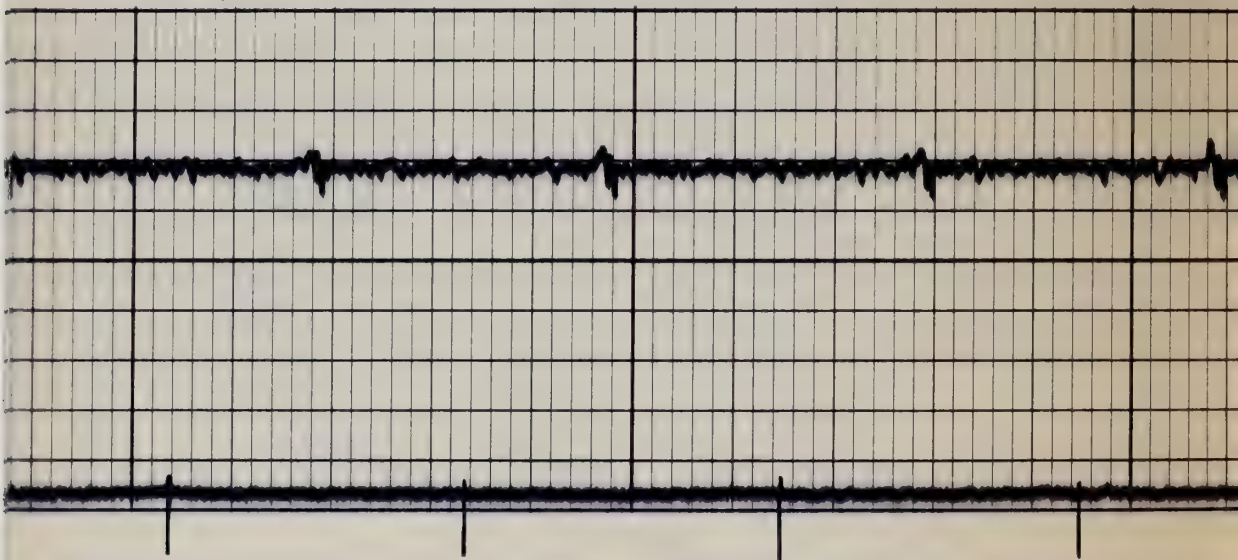
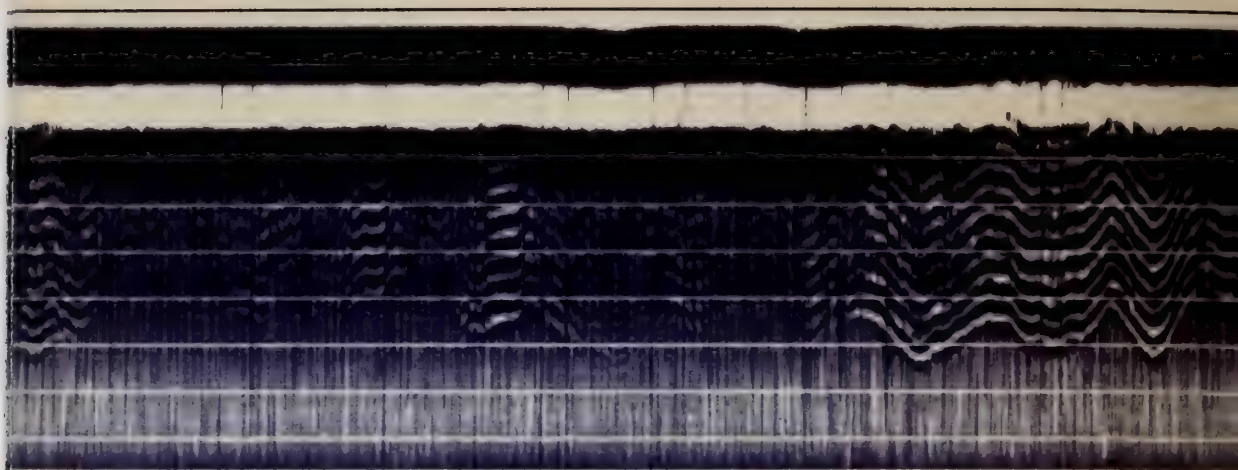




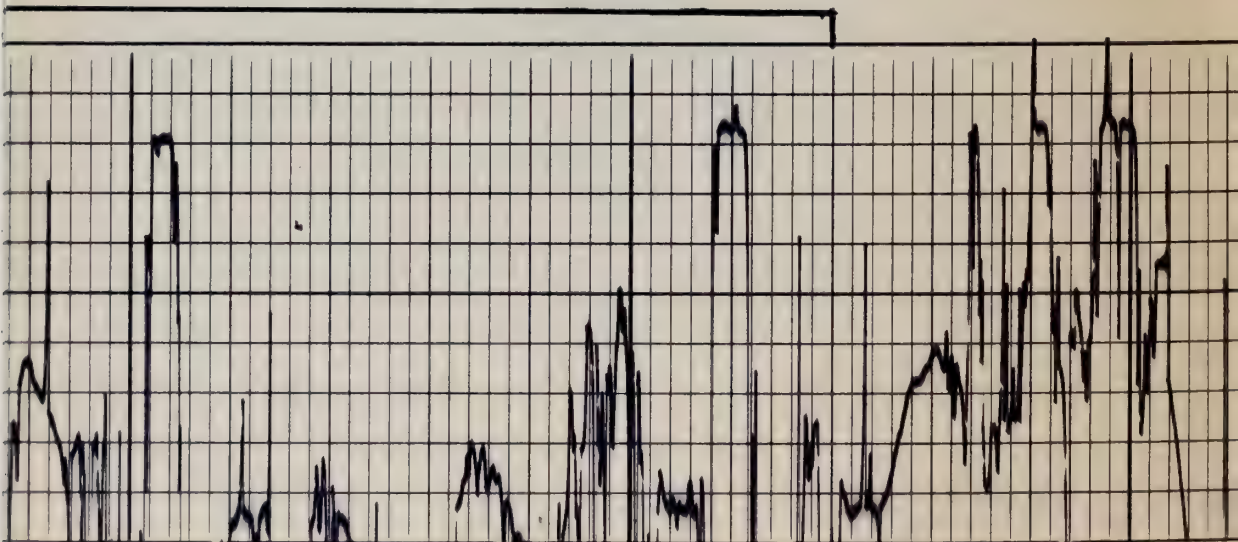
1700

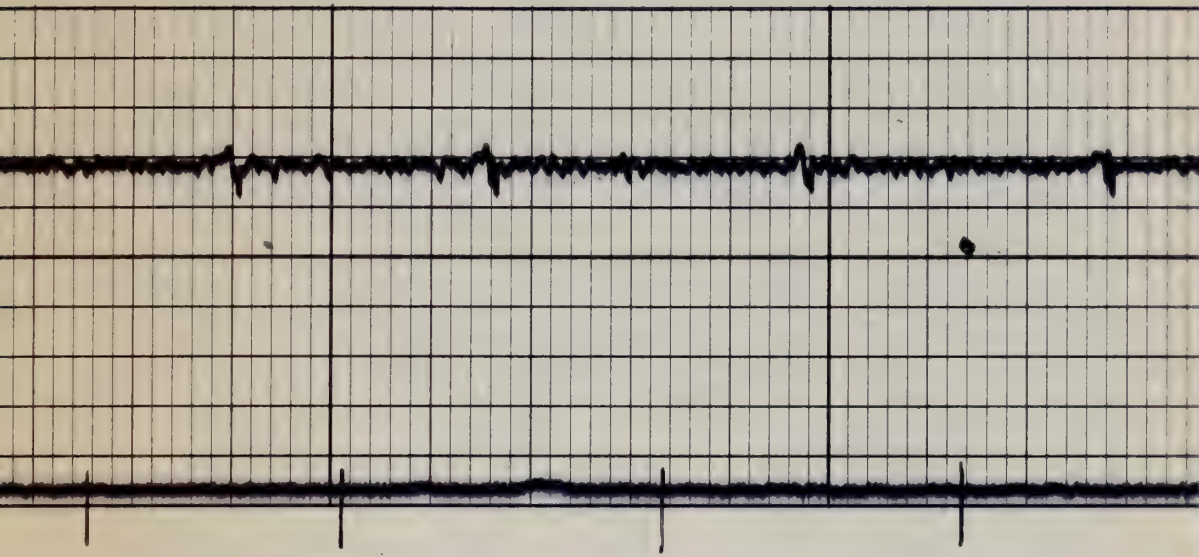
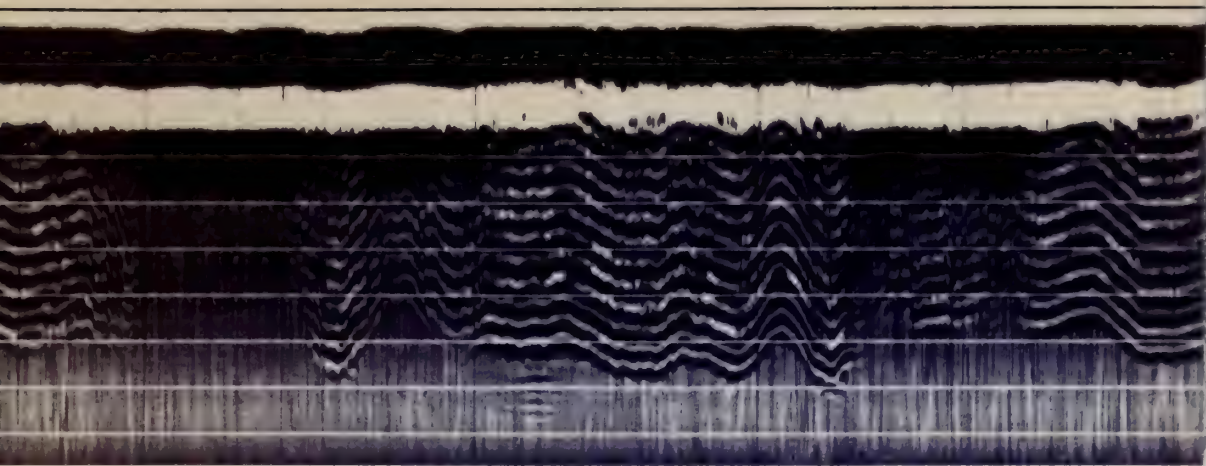


INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH
1-11-42 HYPERDOME

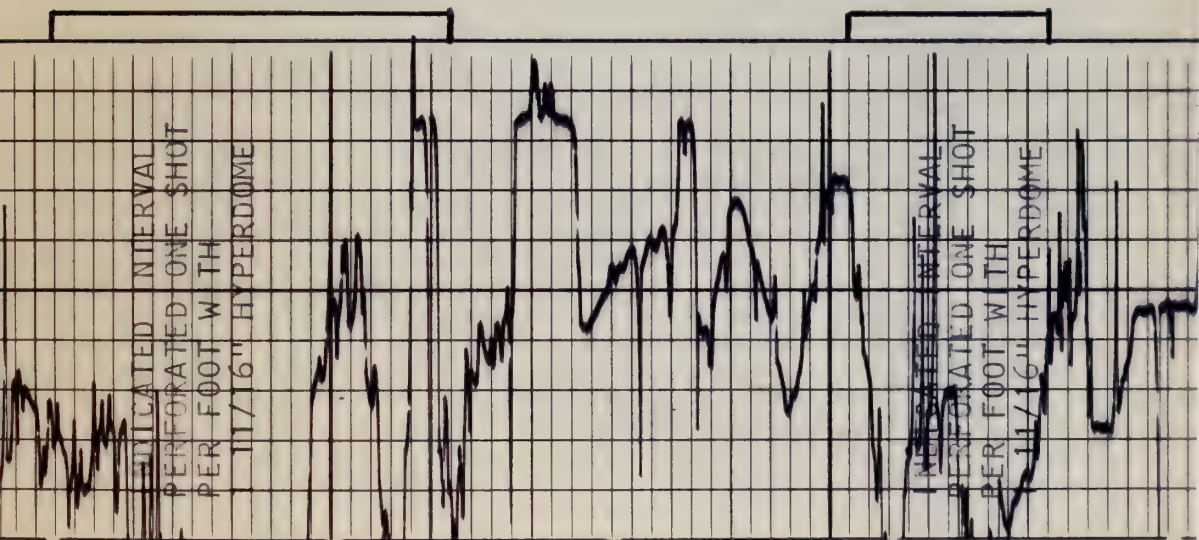


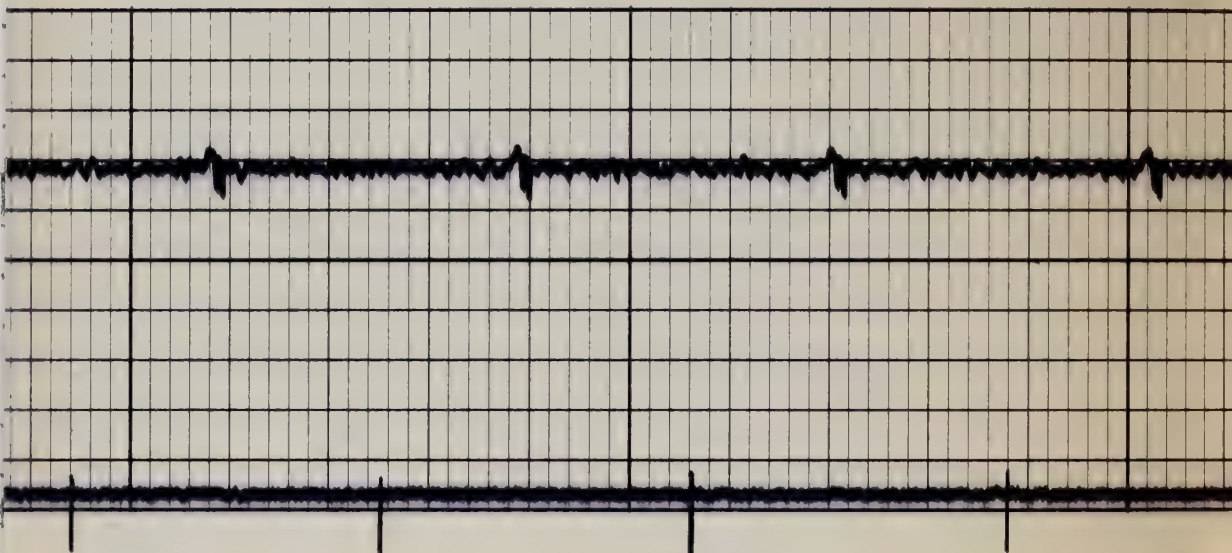
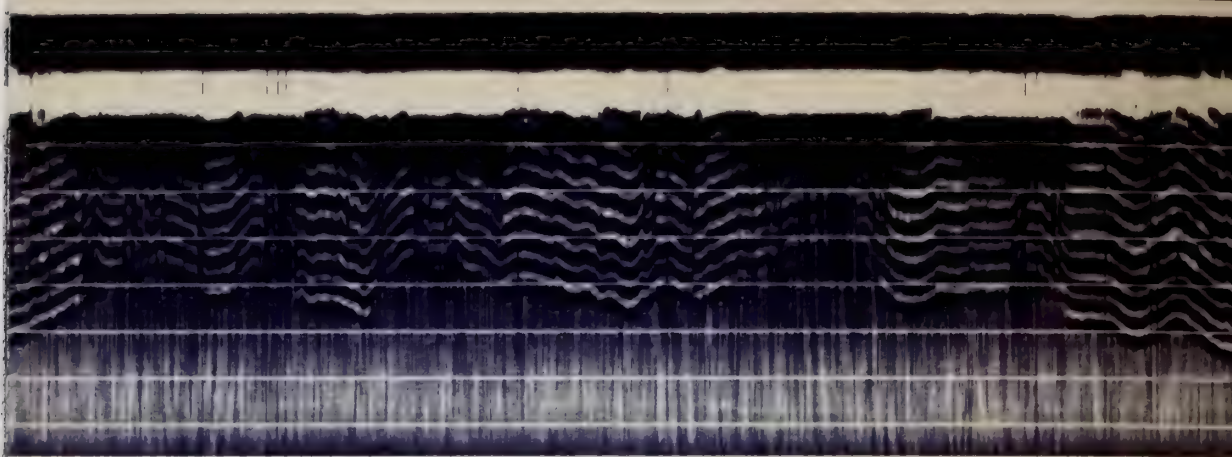
1800





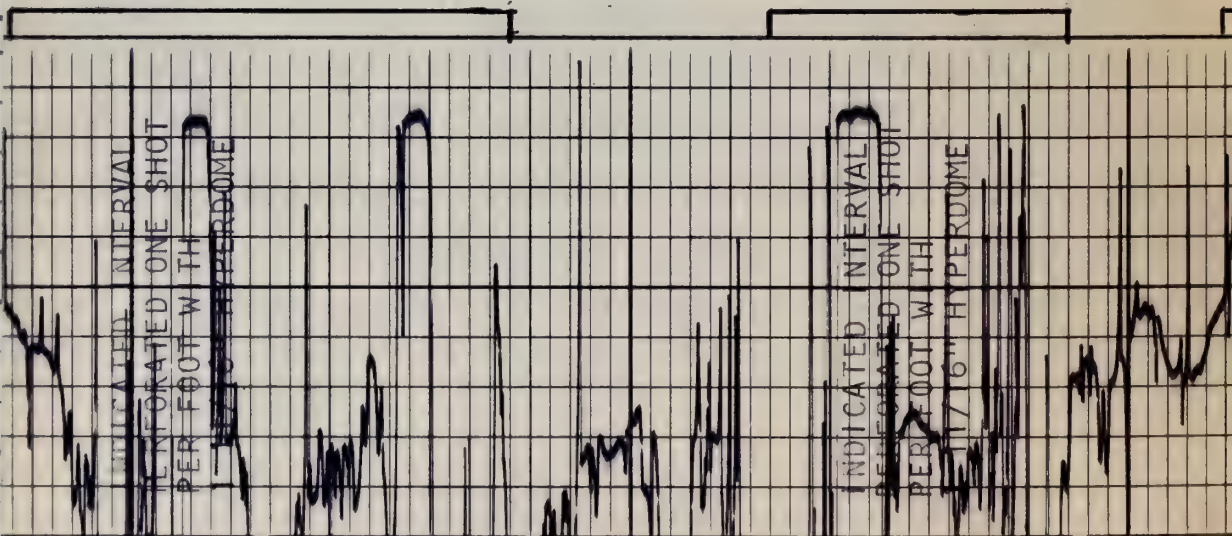
1900

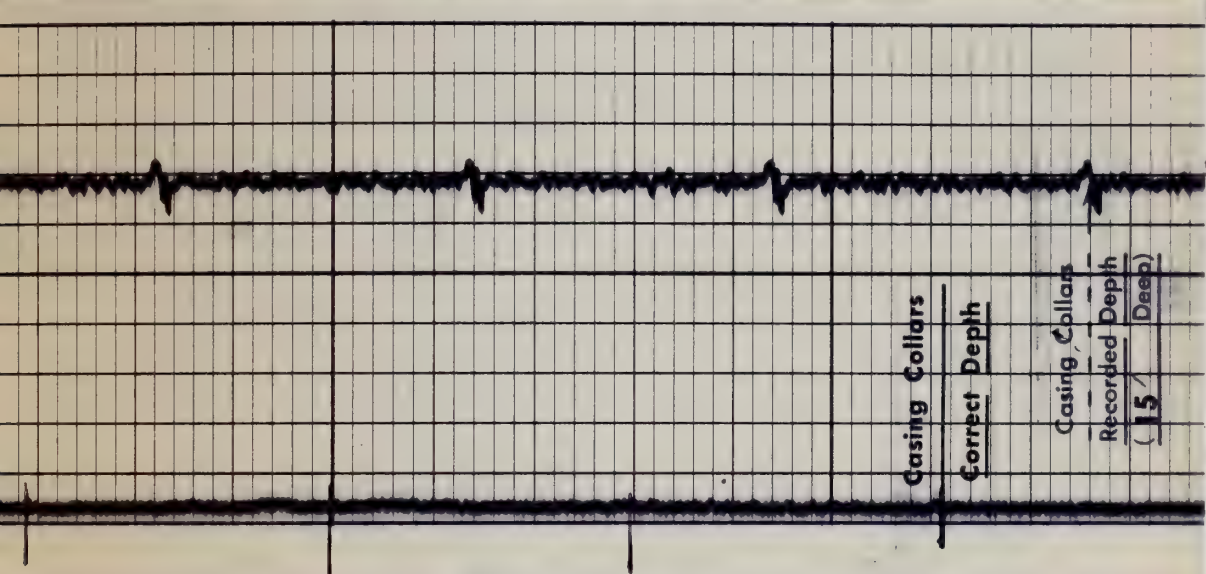
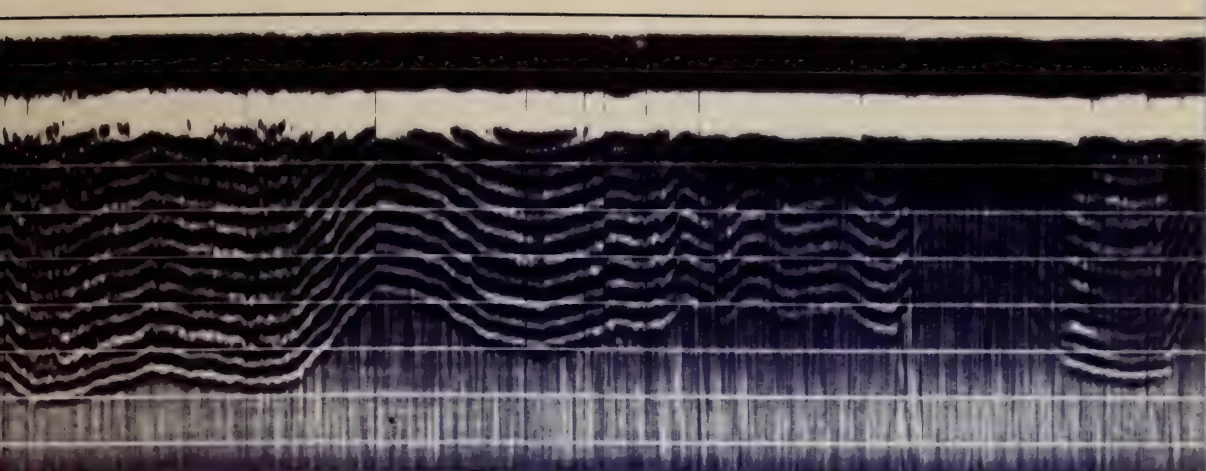




2000

2100





Casing Collars

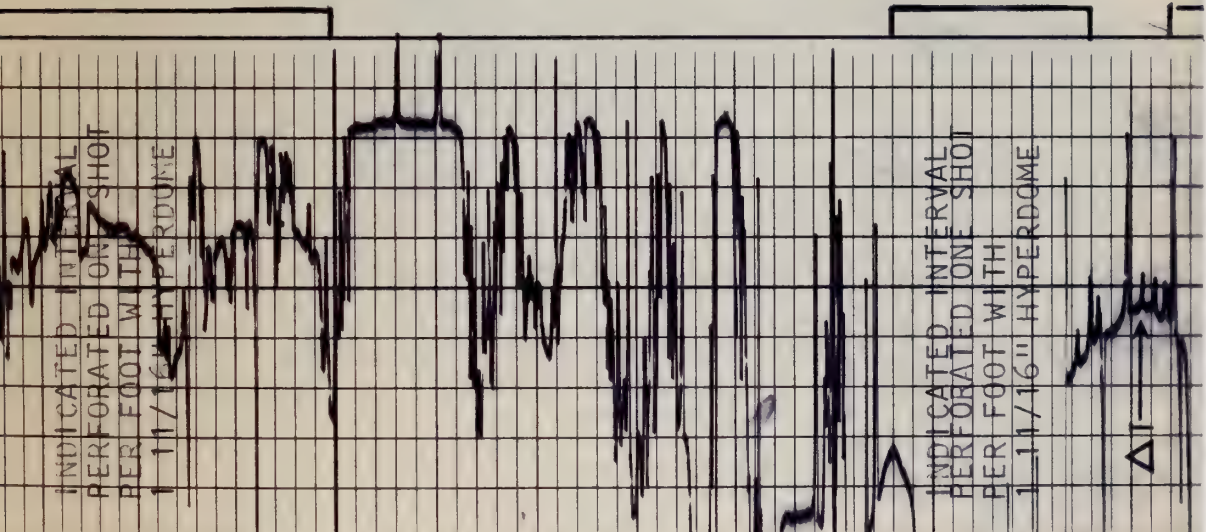
Correct Depth

Casing Collars

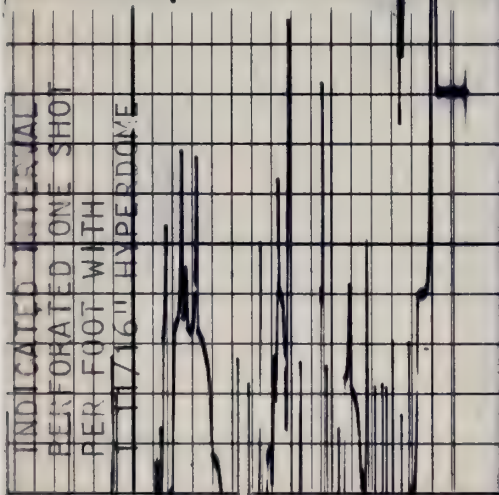
Recorded Depth

(15' Deep)

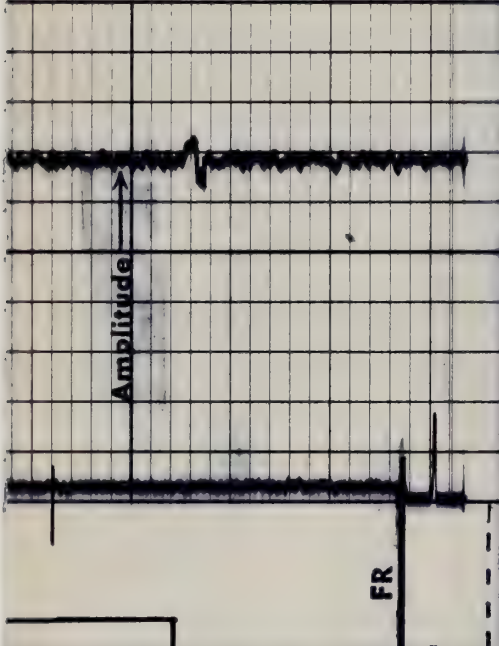
2200



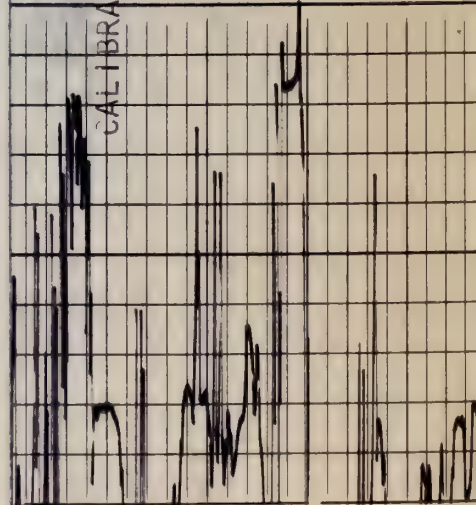
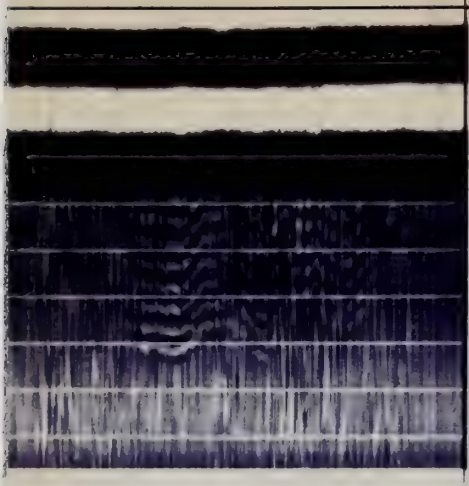
INDICATED INTERVAL
 PERFORATED ONE SHOT
 PER FOOT WITH
 11/16" HYPERDOME



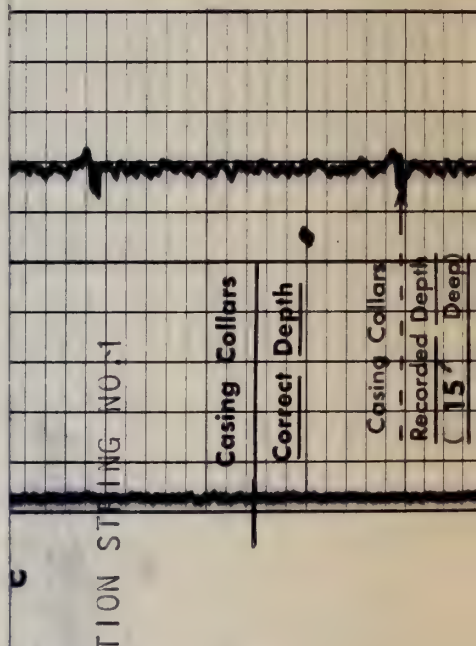
FR



Amplitude



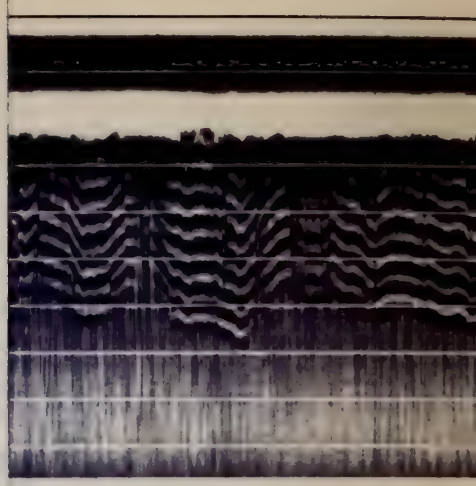
CALIBRATION STRING NO. 1

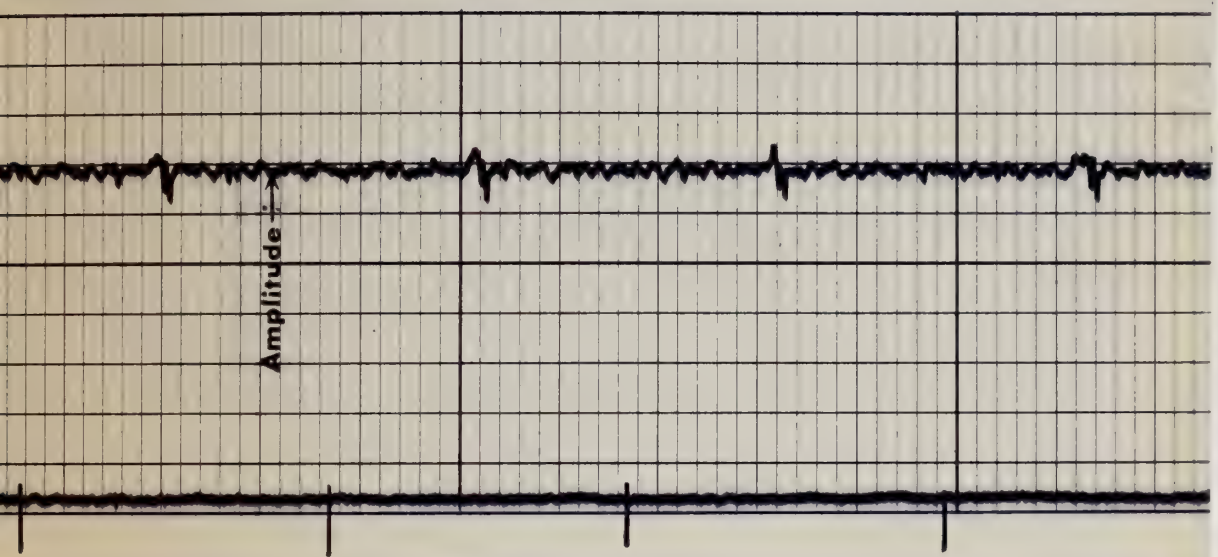
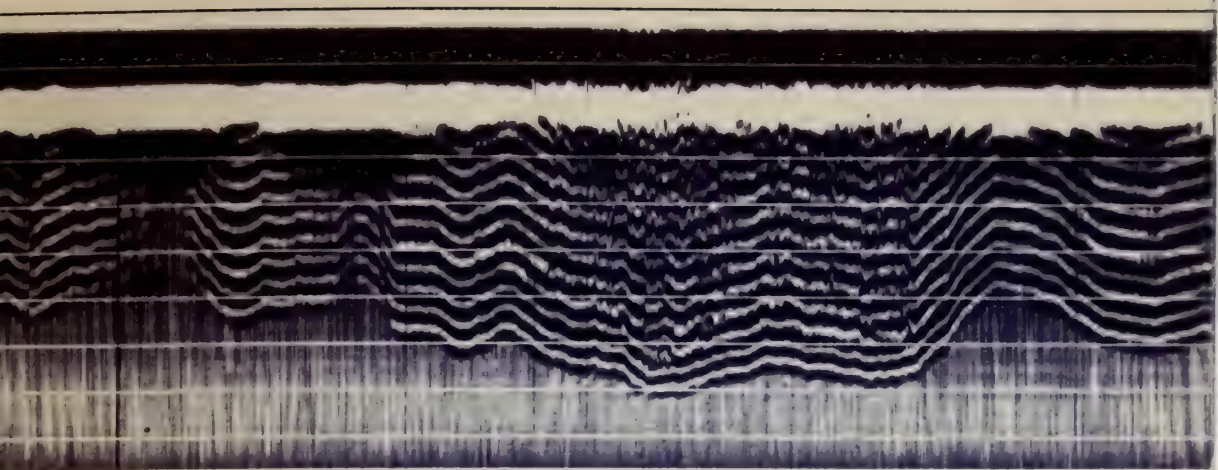


Casing Collars

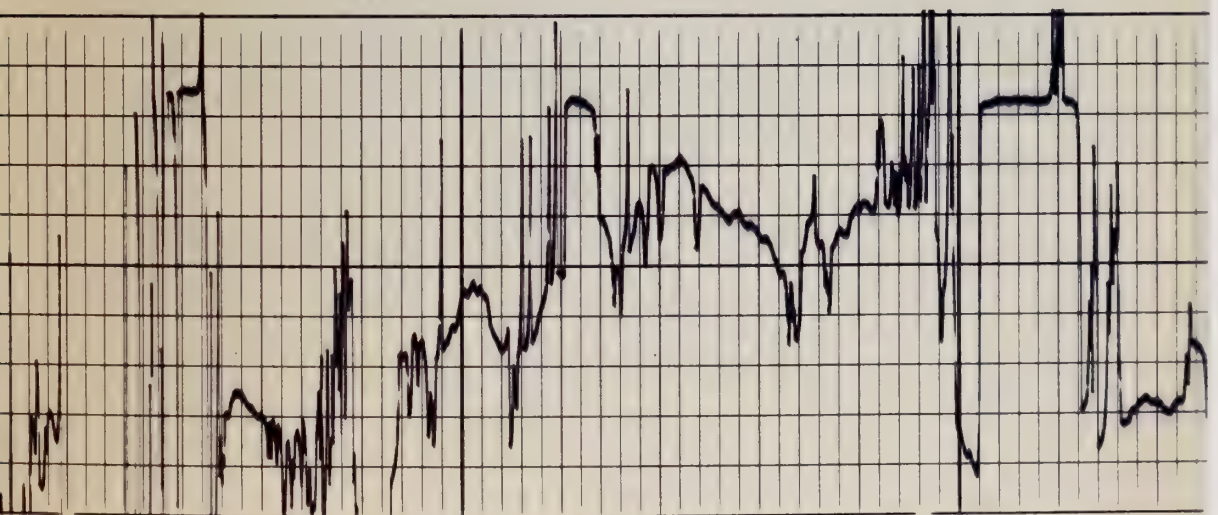
Correct Depth

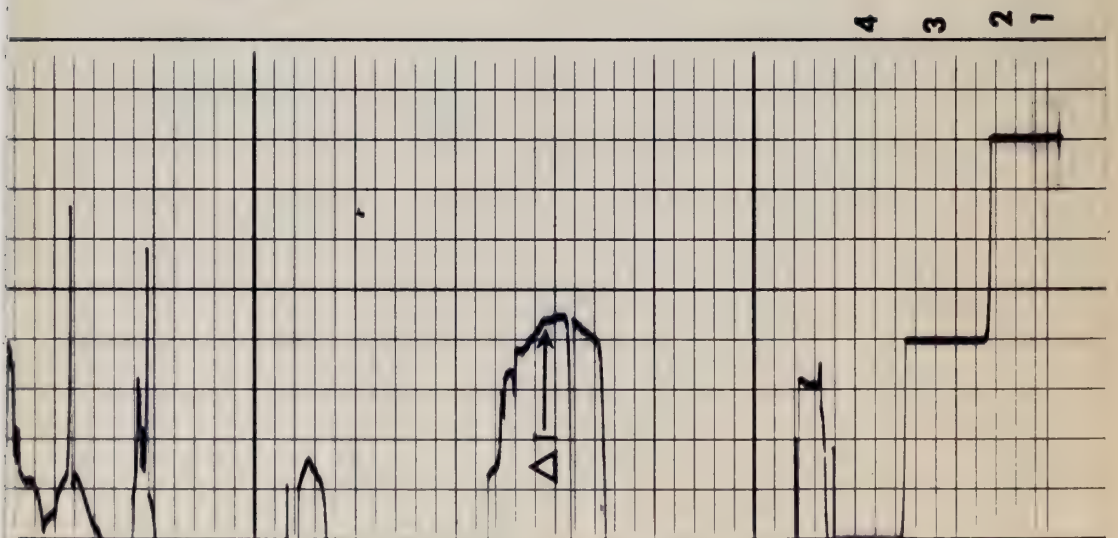
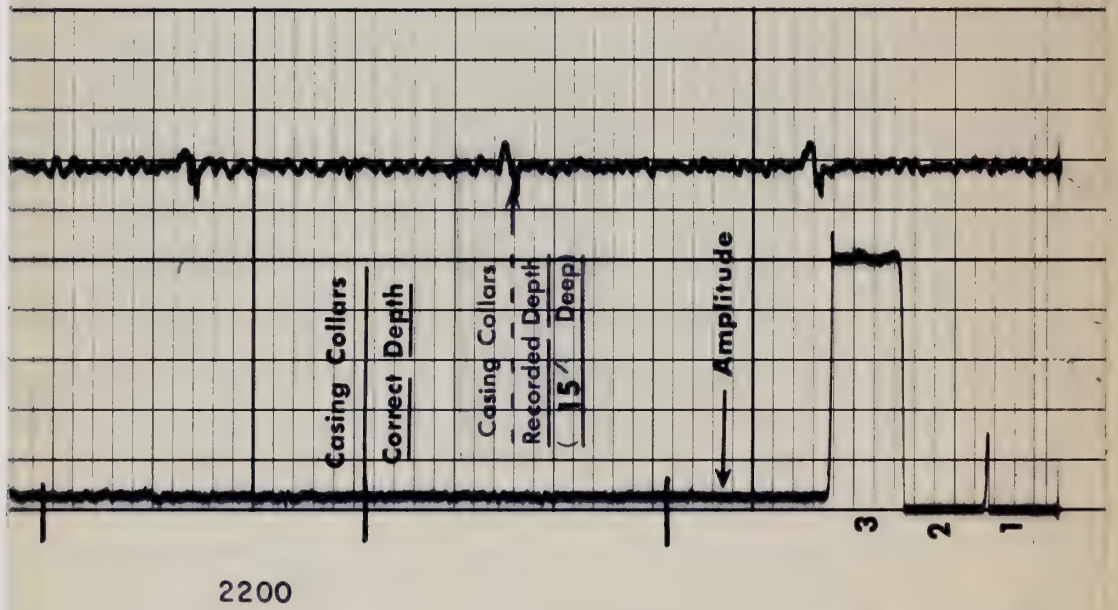
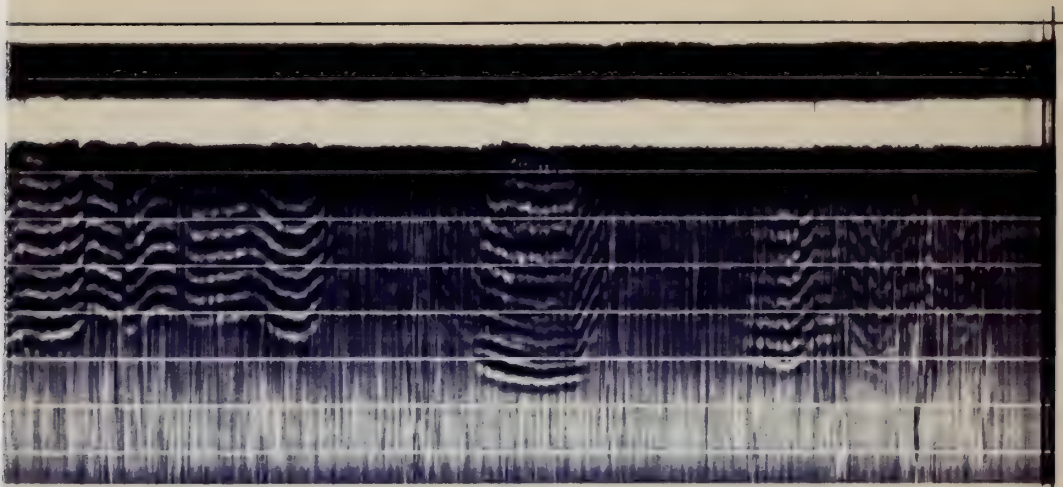
Casing Collars	Recorded Depth	Depth
	(15'	



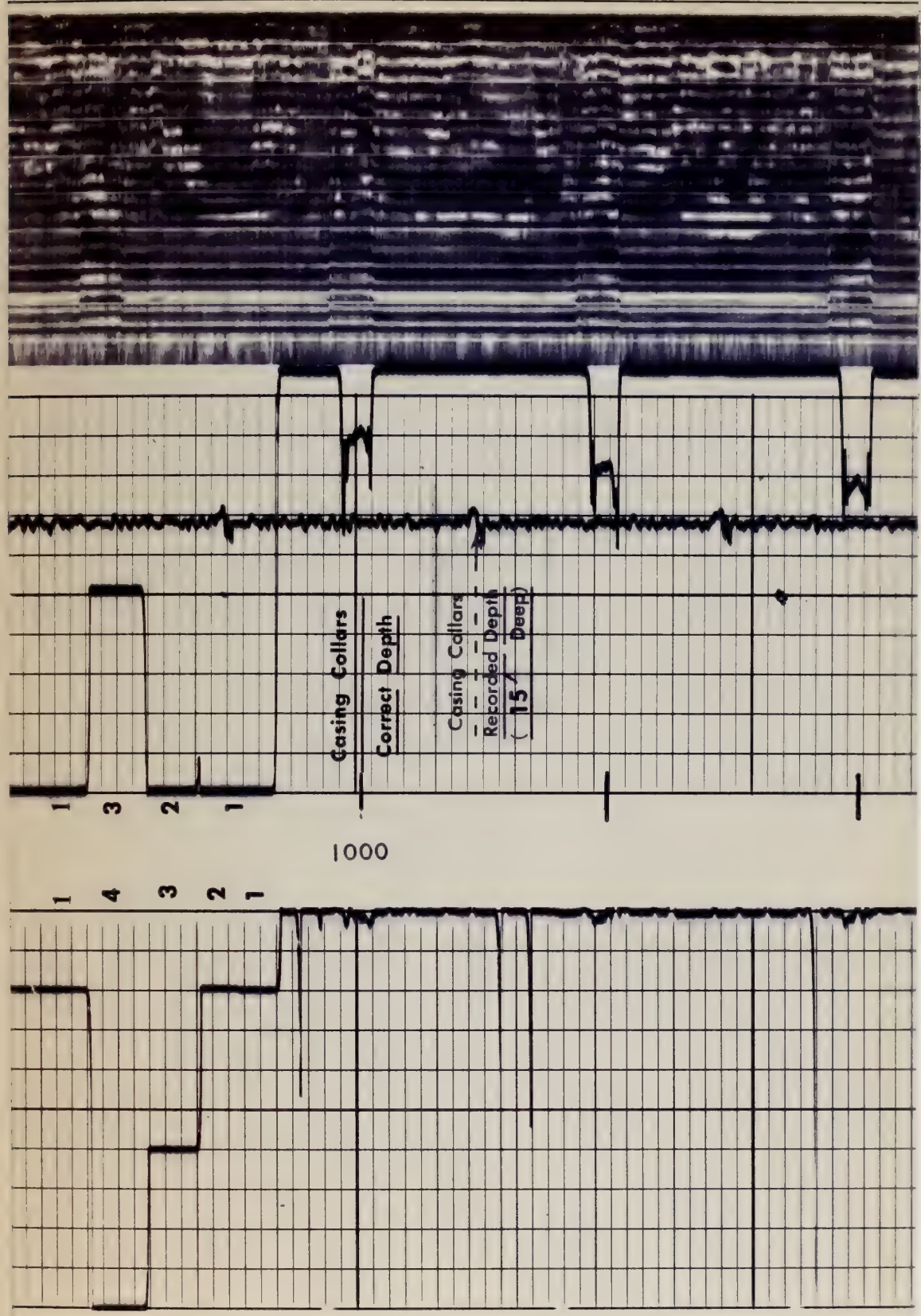


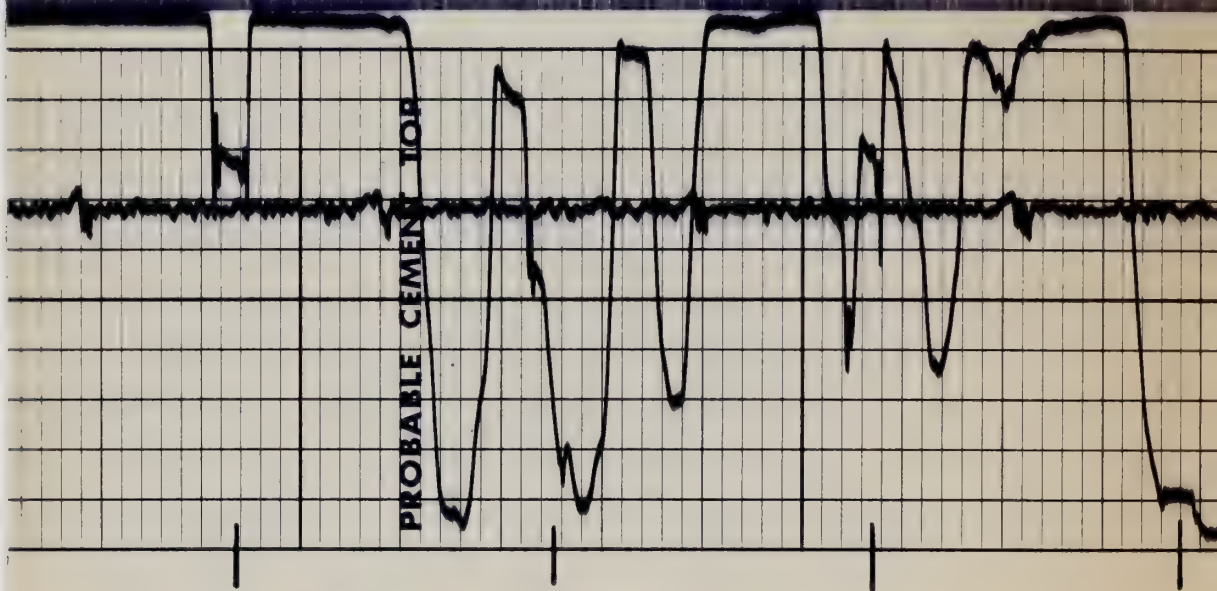
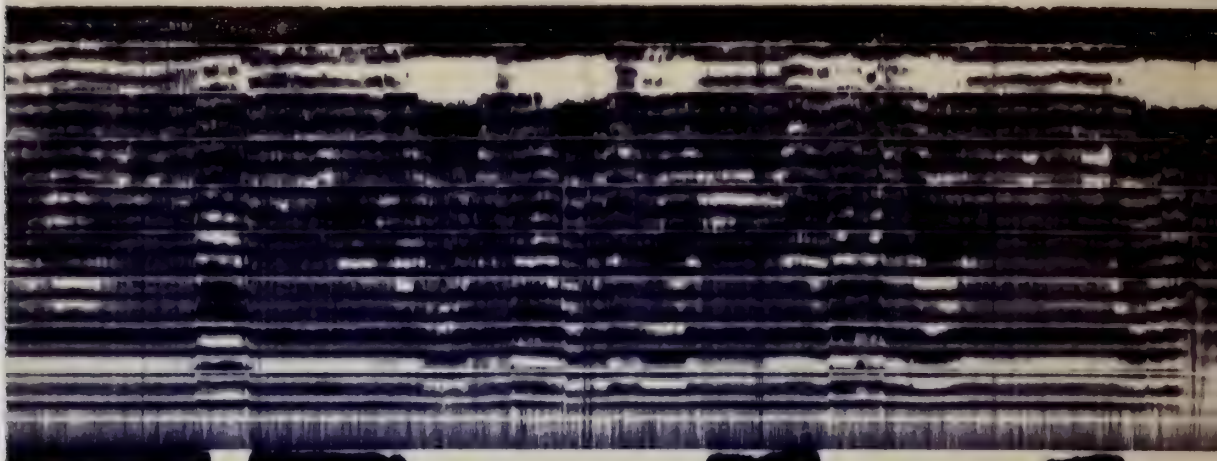
2100



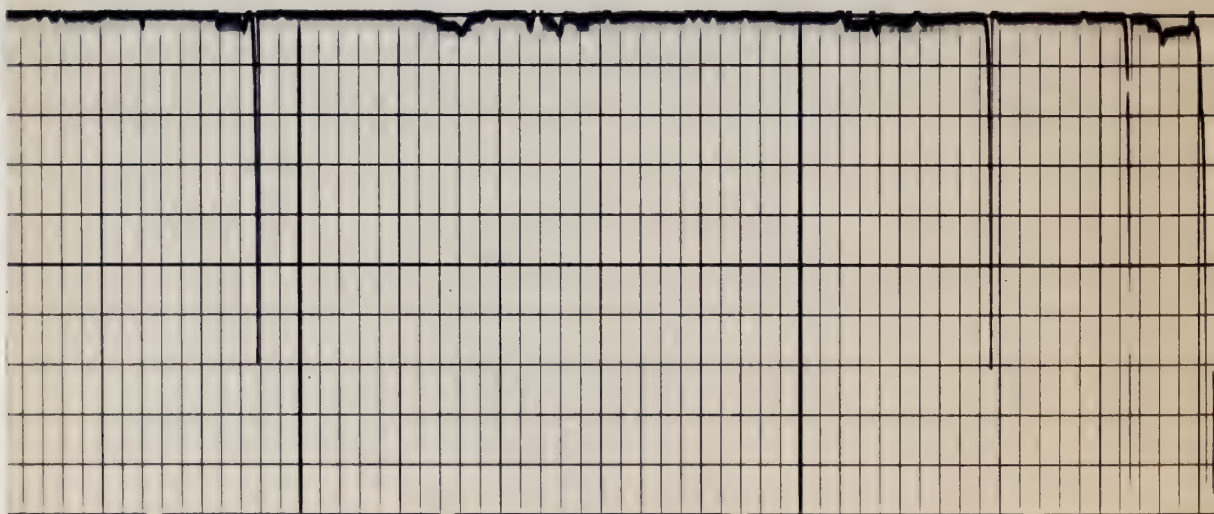


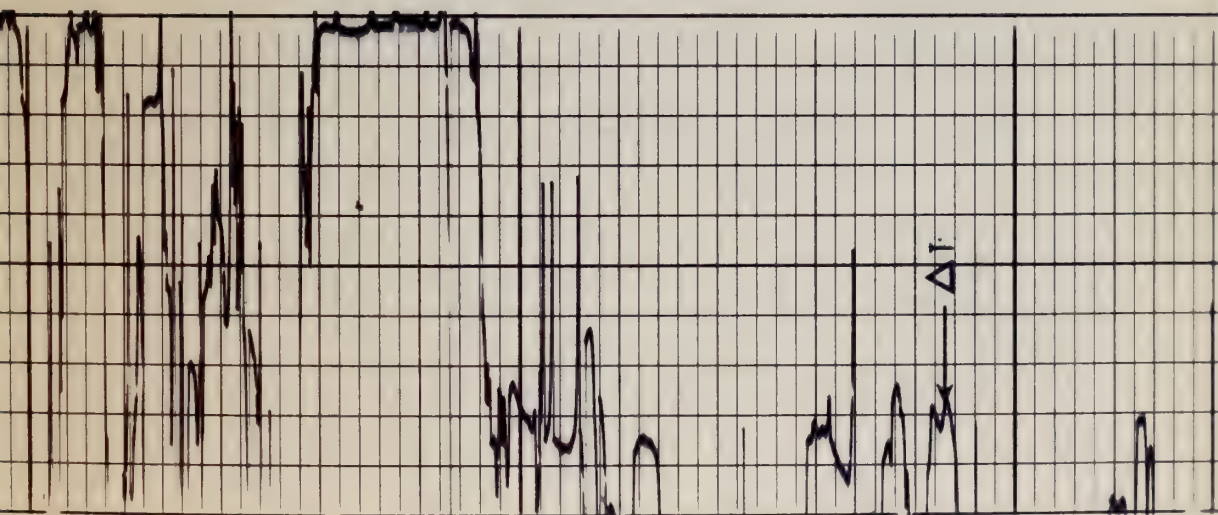
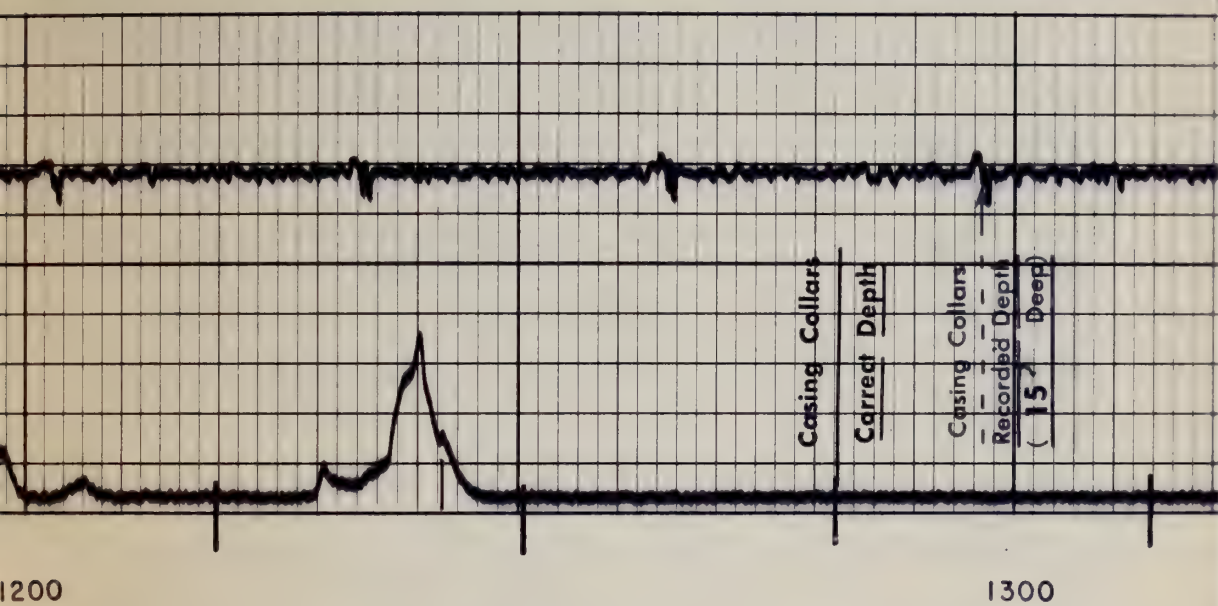
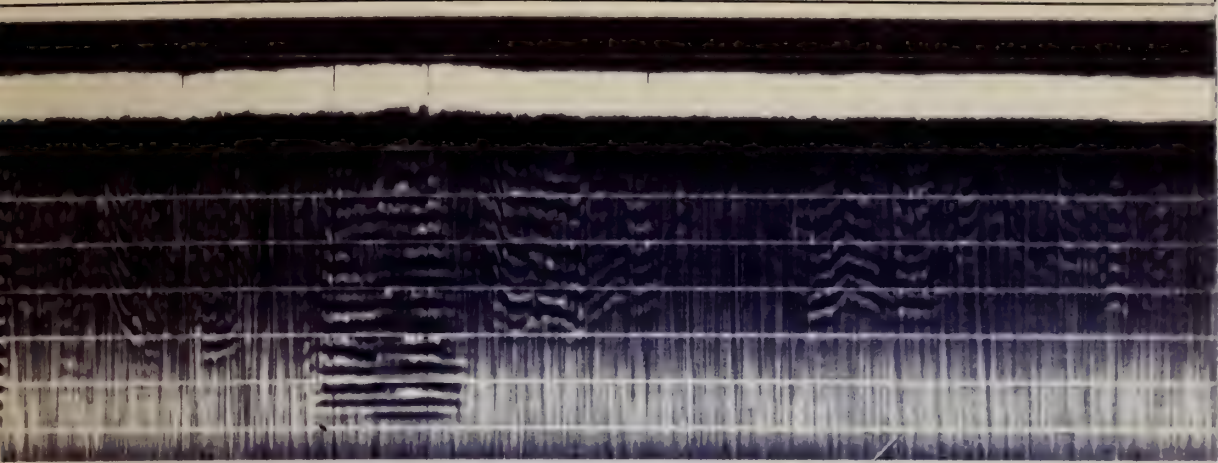
REPEAT SECTION - NO.1 - LONG STRING

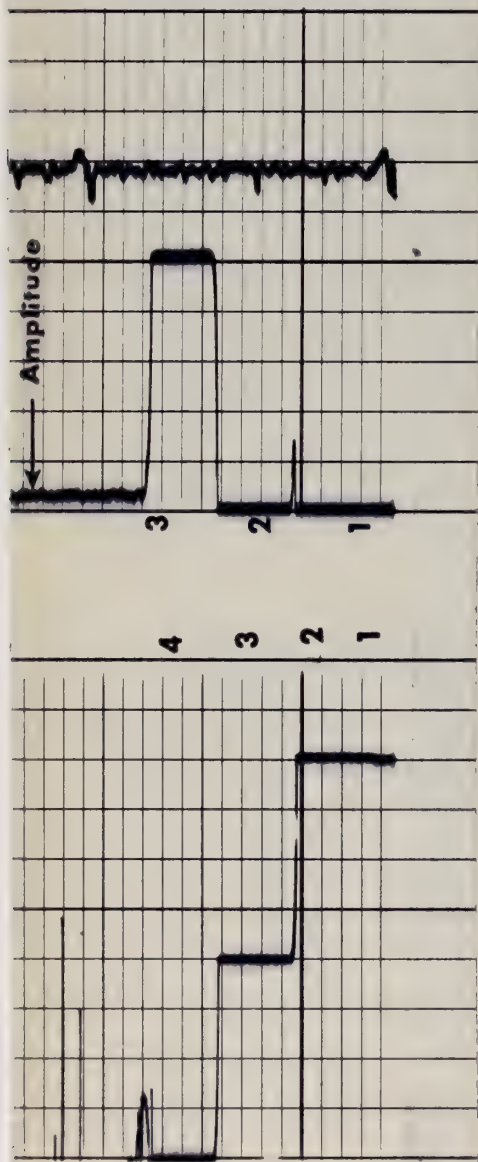
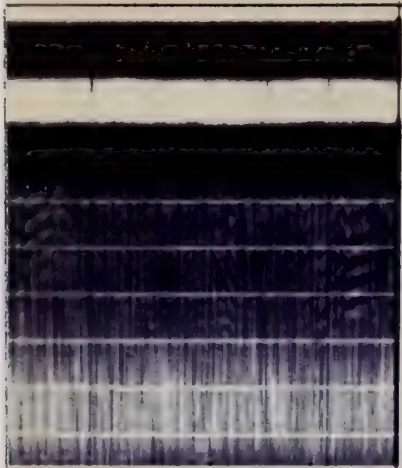




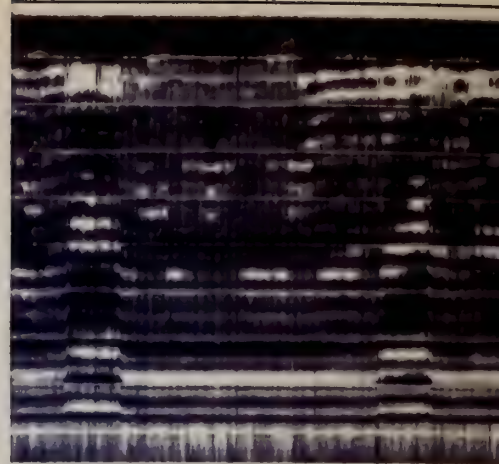
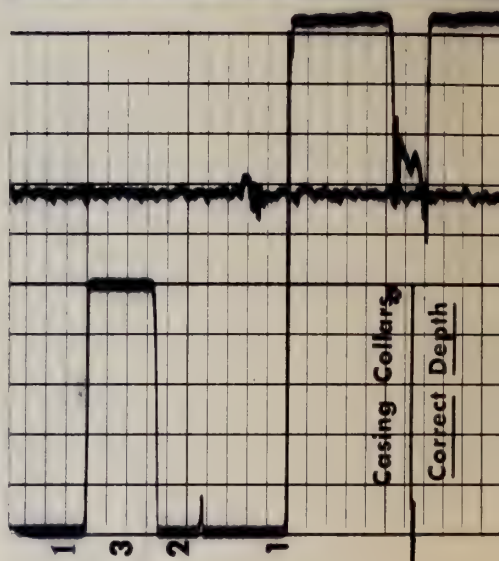
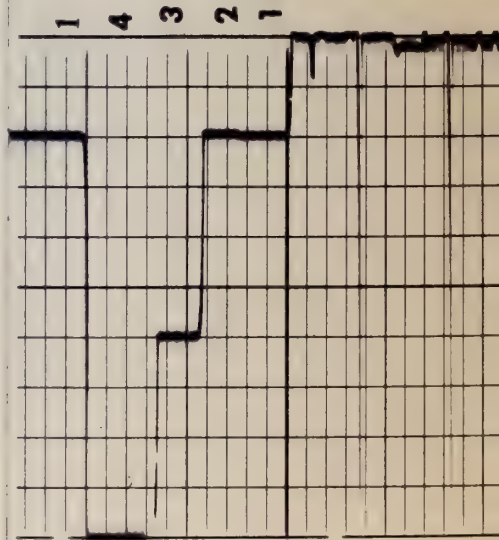
1100



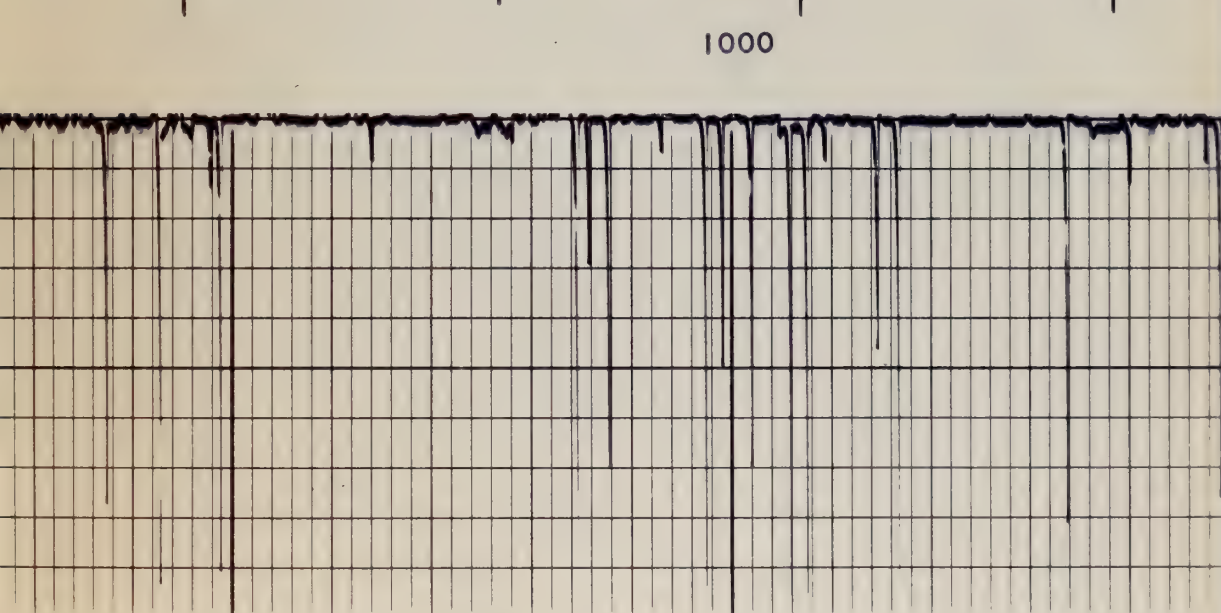
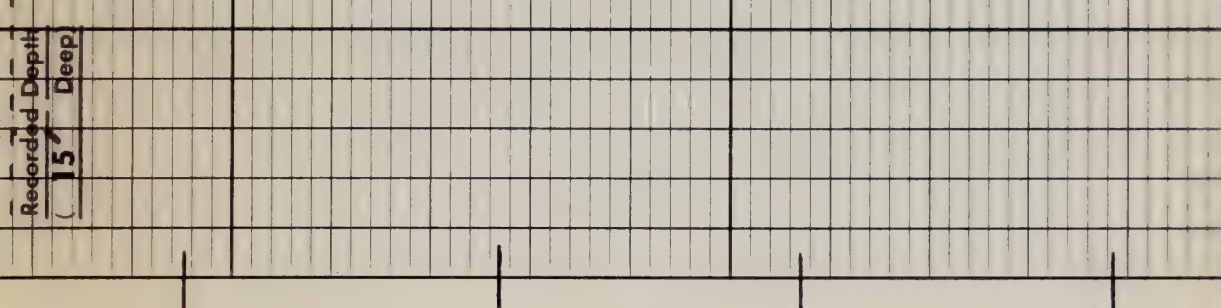
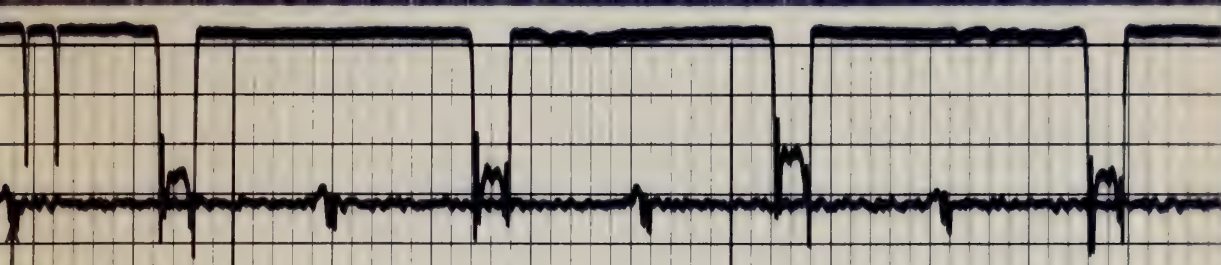
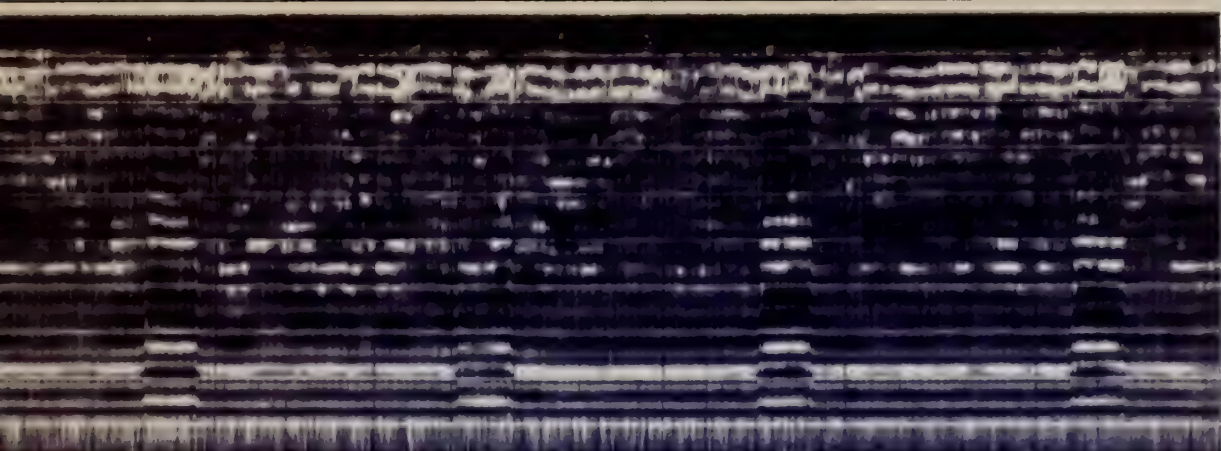




NO. 2 - SHORT STRING

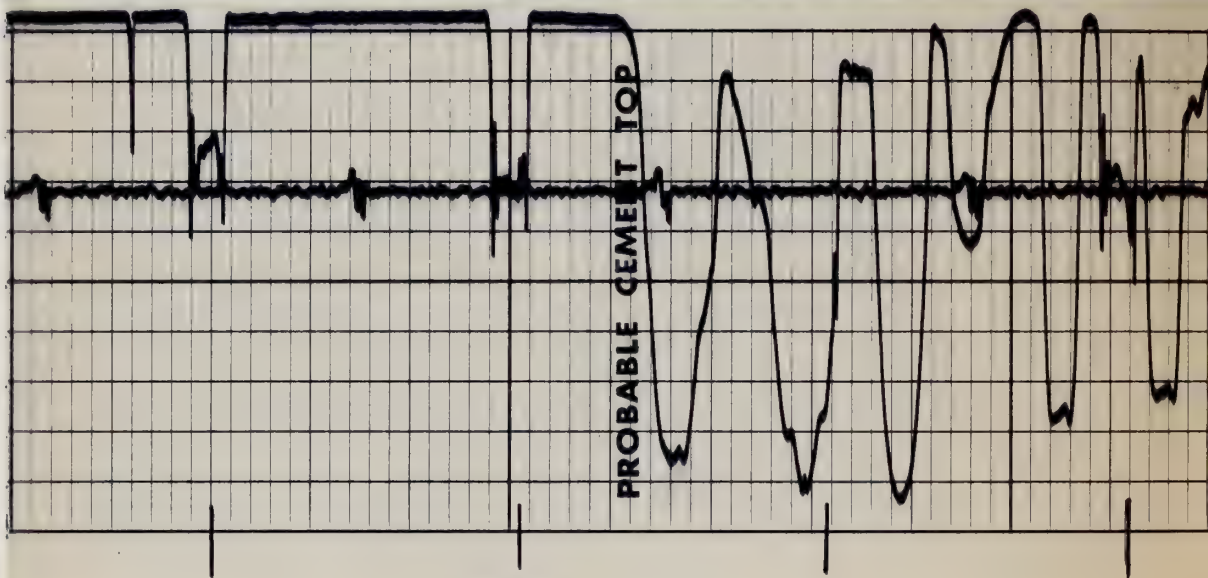
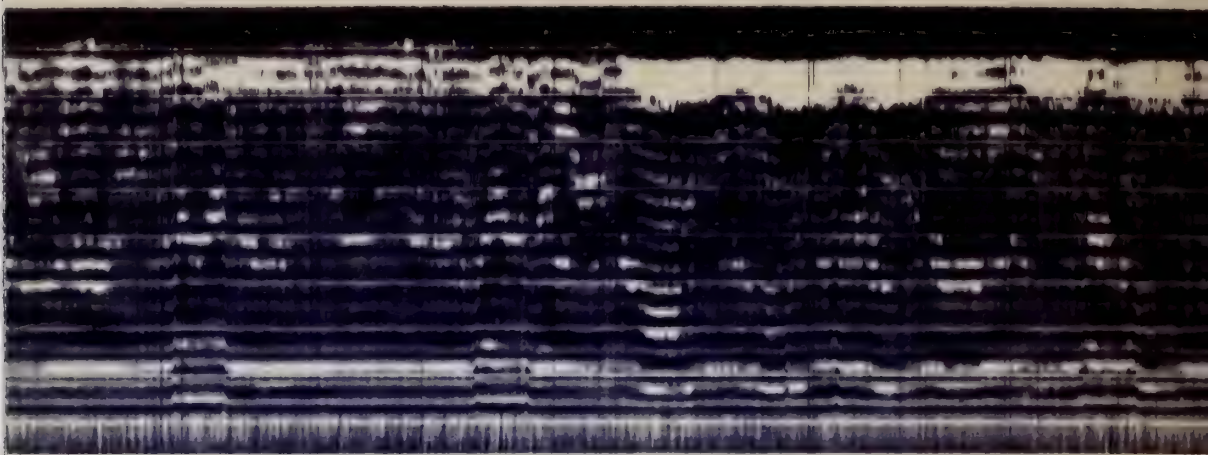


0900



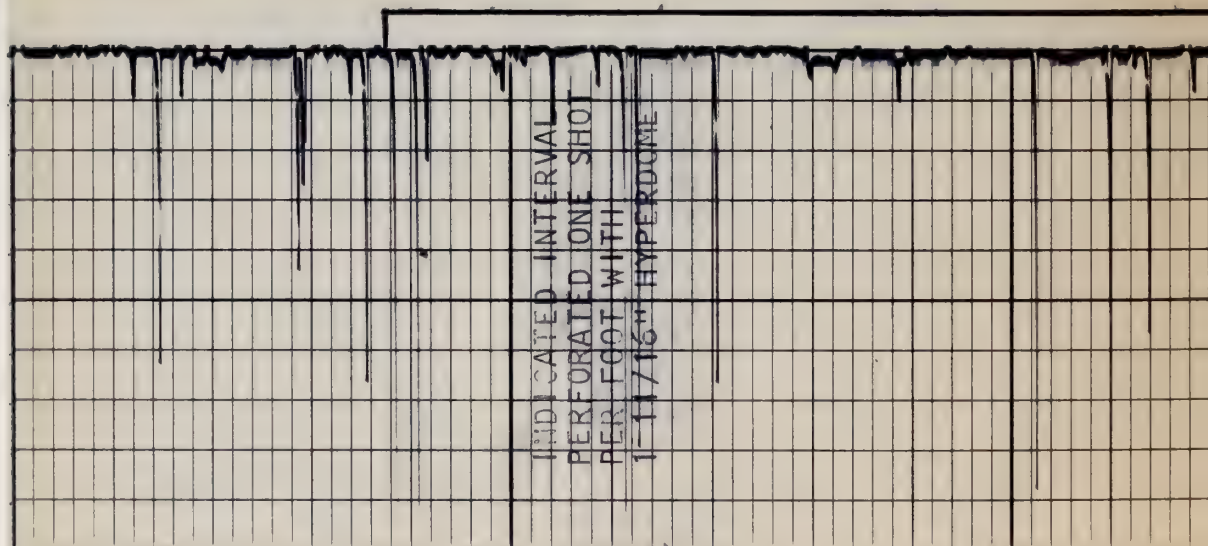
Recorded Depth
(15' Deep)

1000

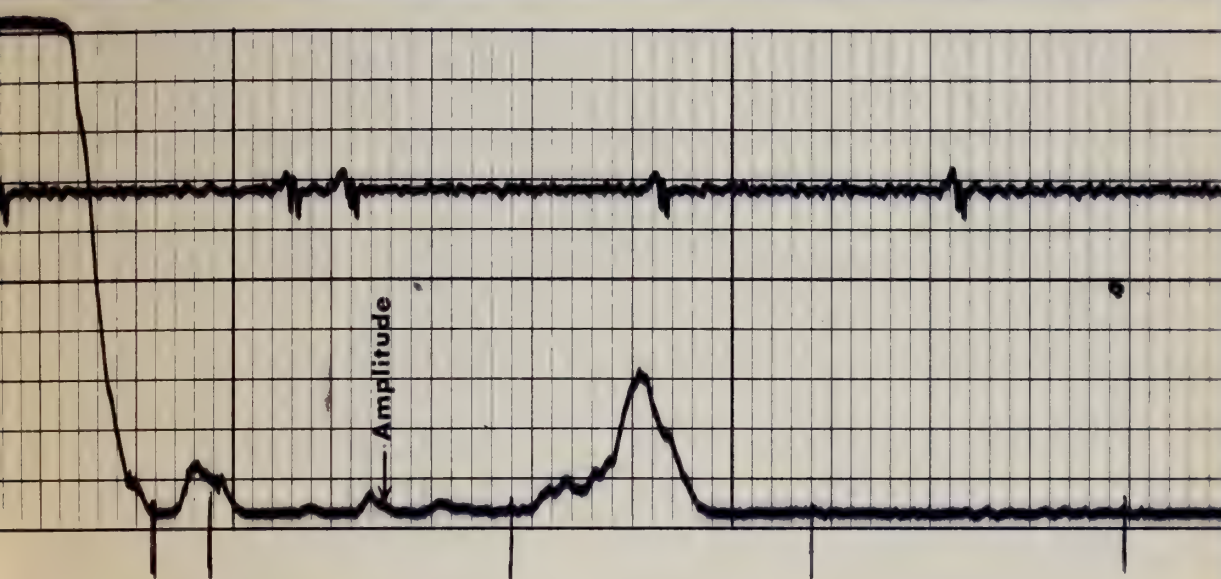
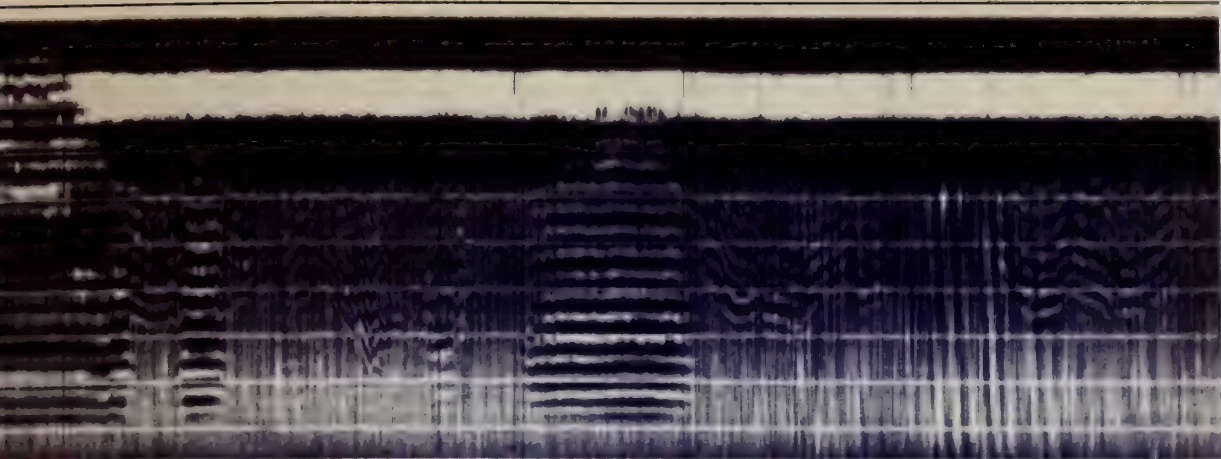


PROBABLE CEMENT TOP

1100

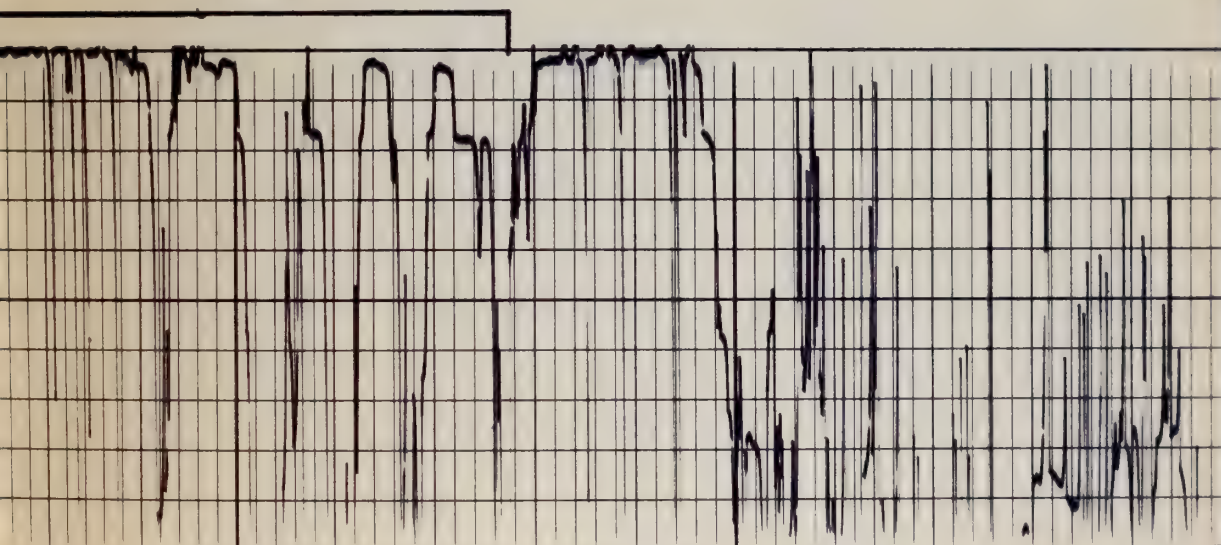


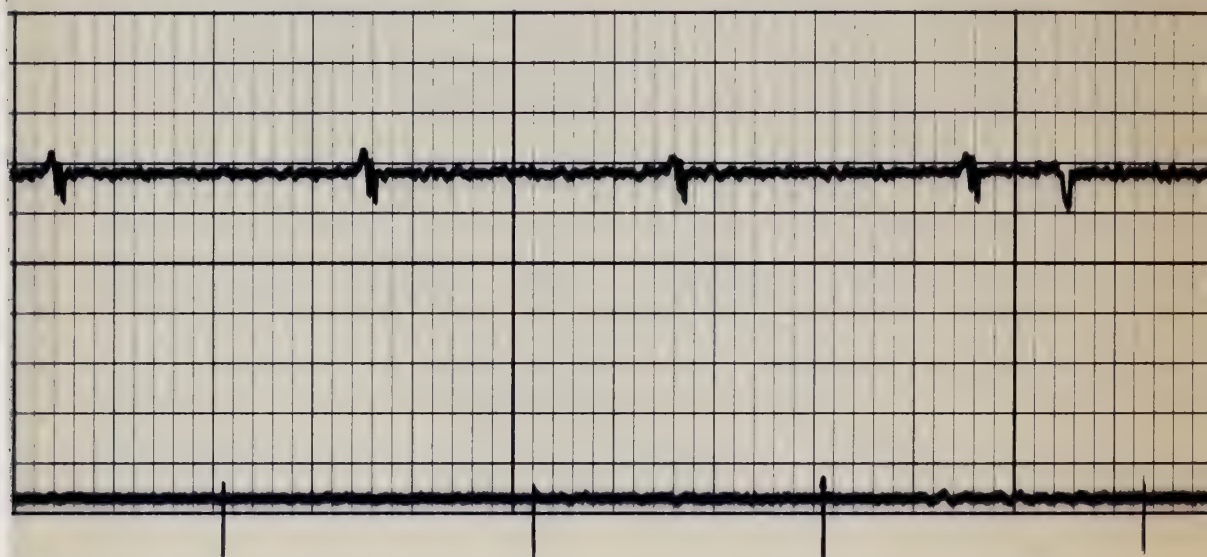
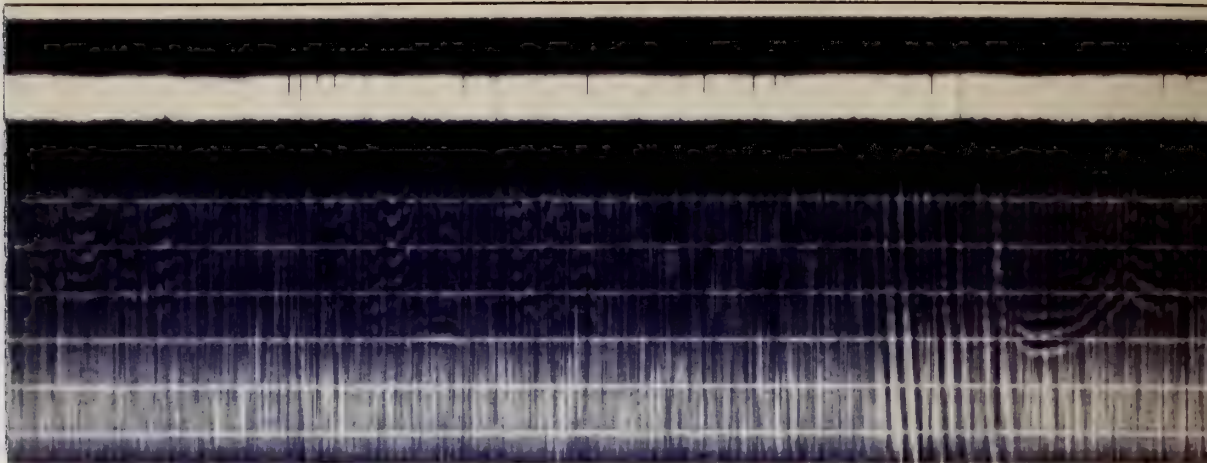
INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH
1-11/16" HYPERDOME



1200

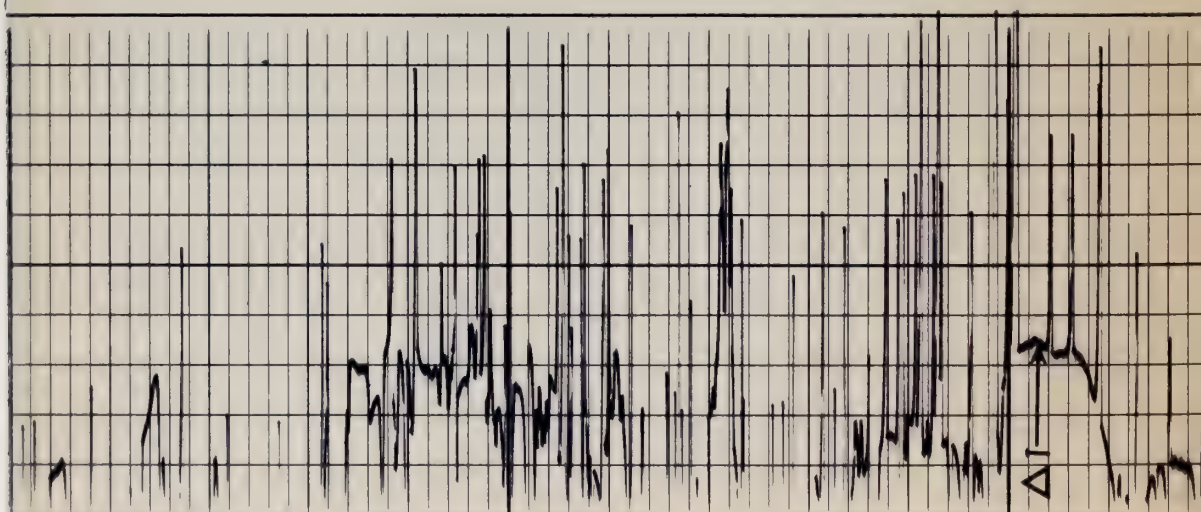
13

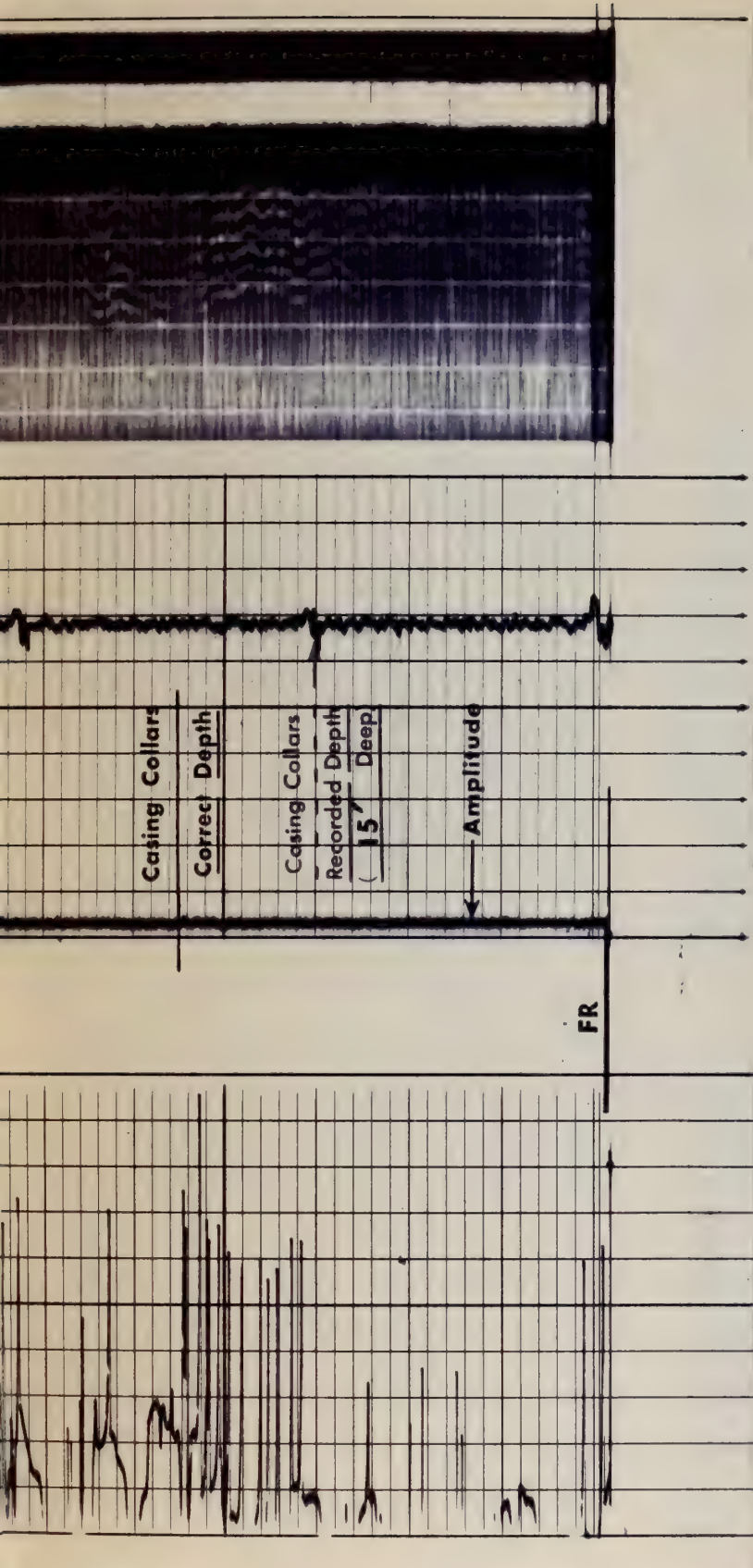




00

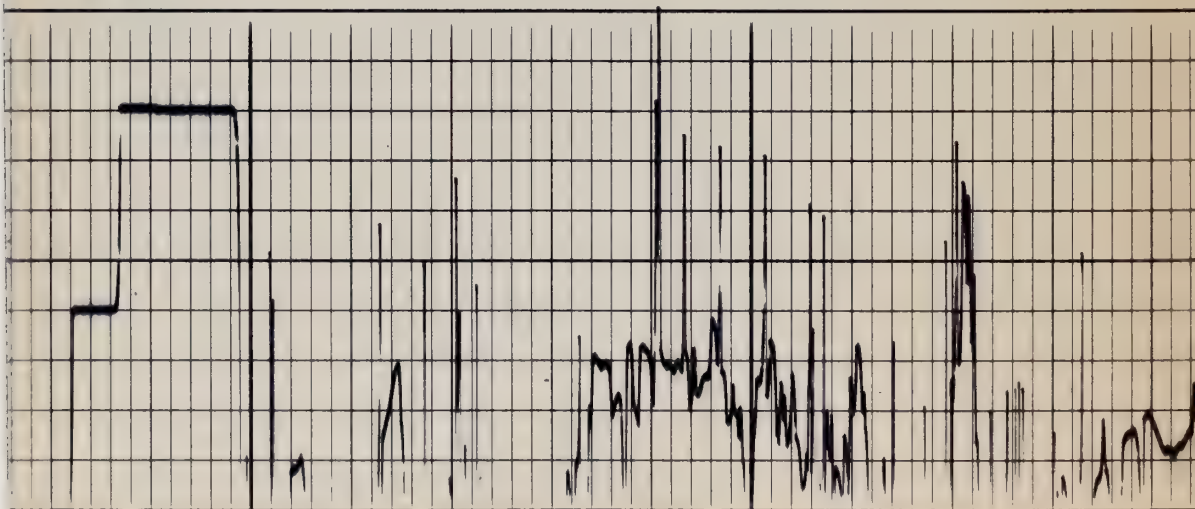
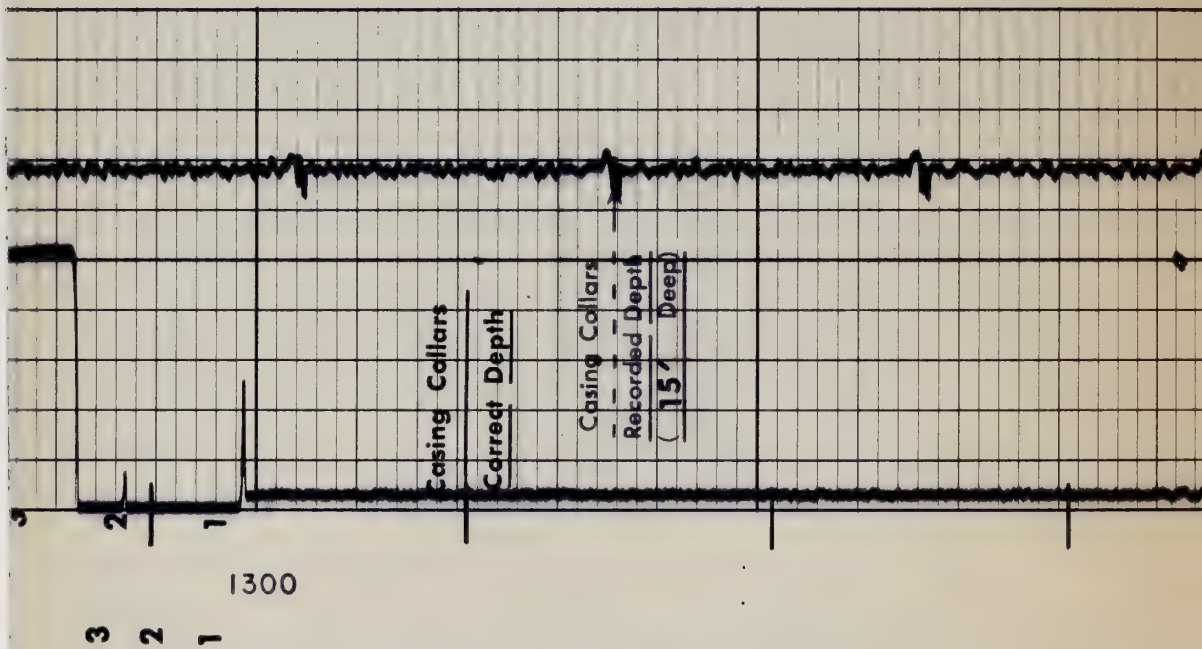
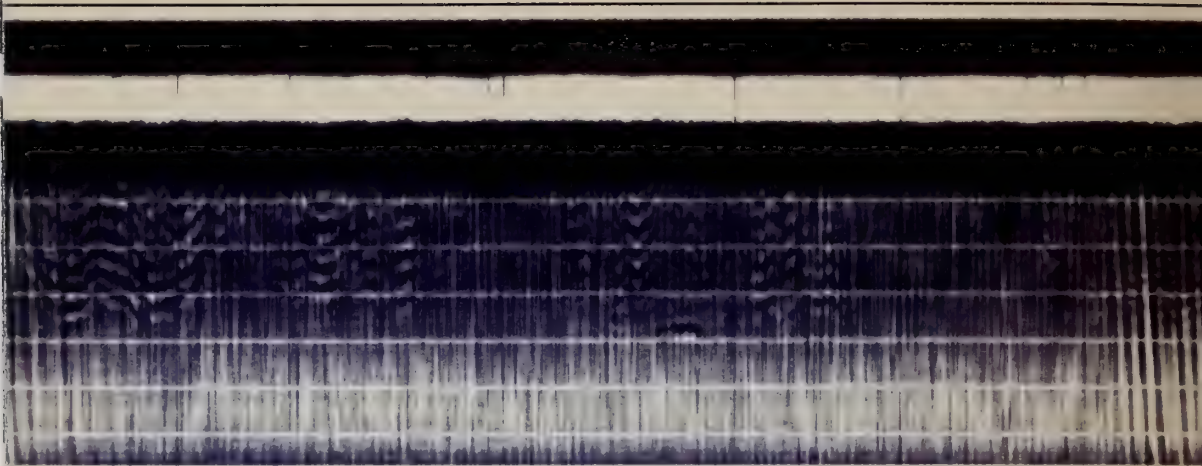
1400

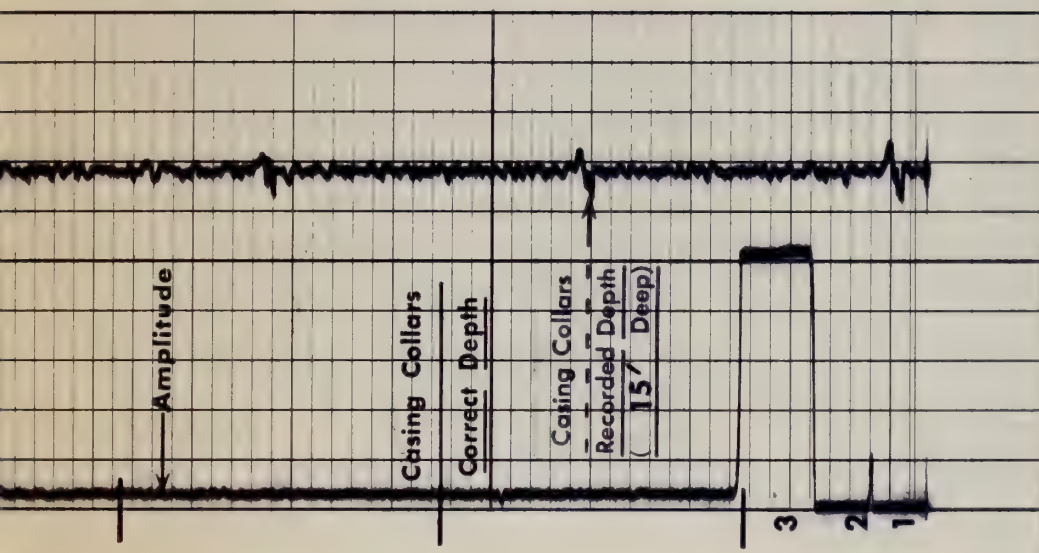
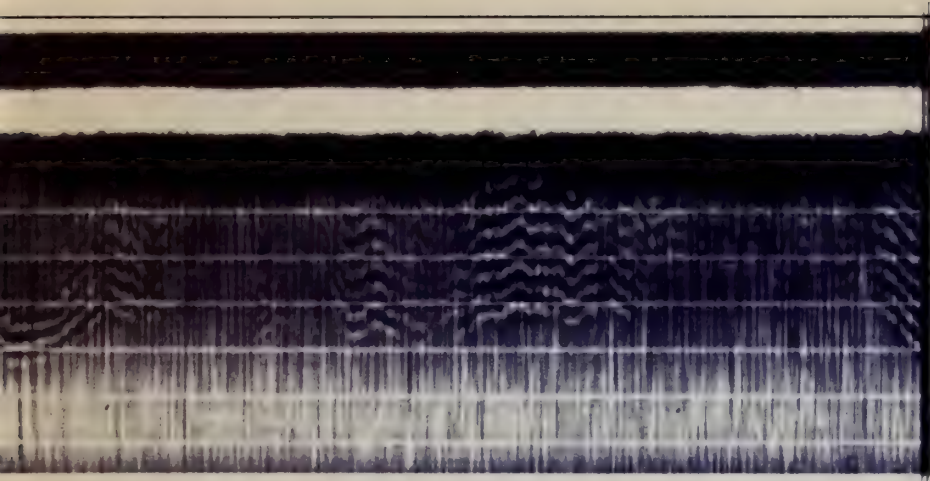




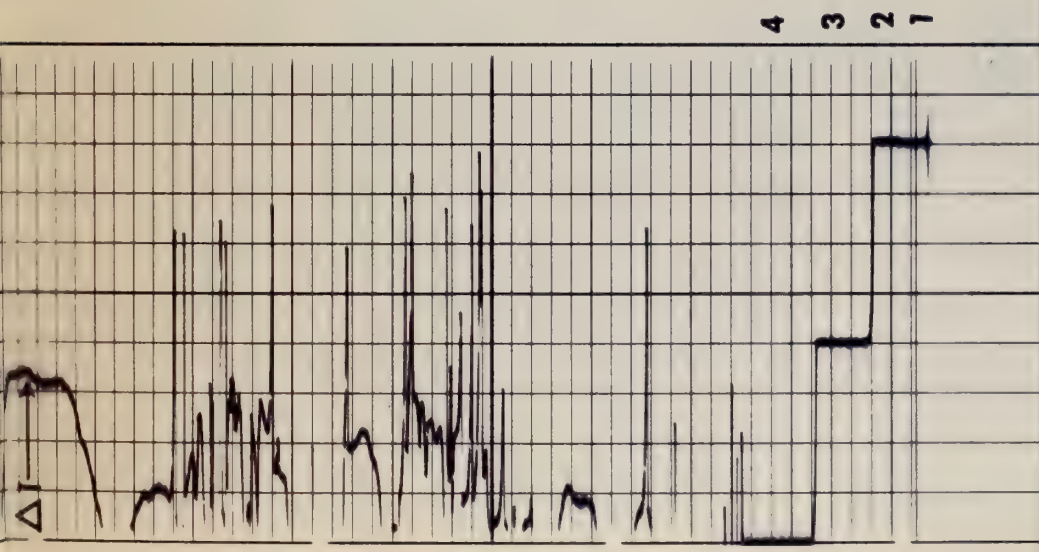
CALIBRATION RUN - NO. 2 - SHORT STRING



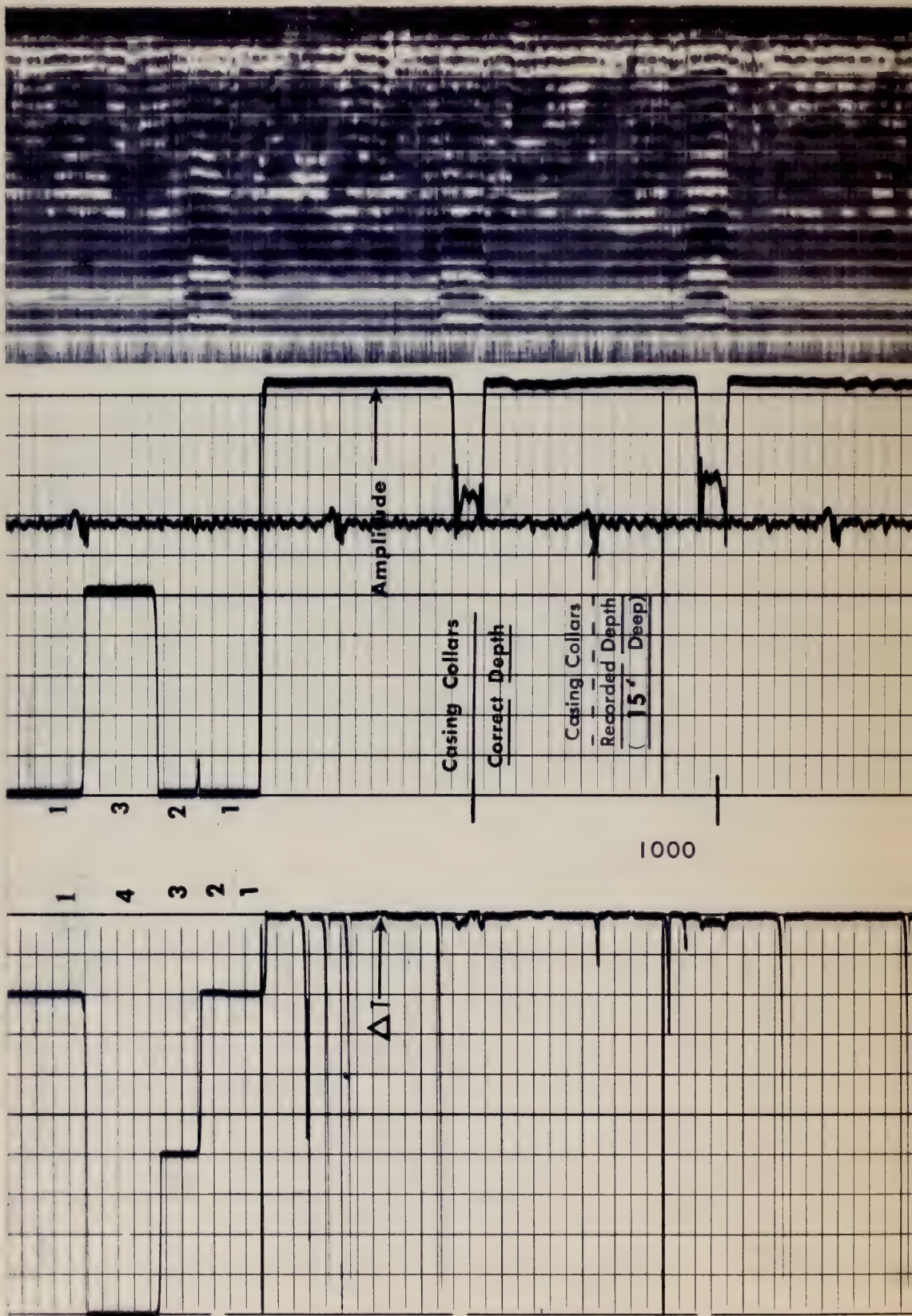


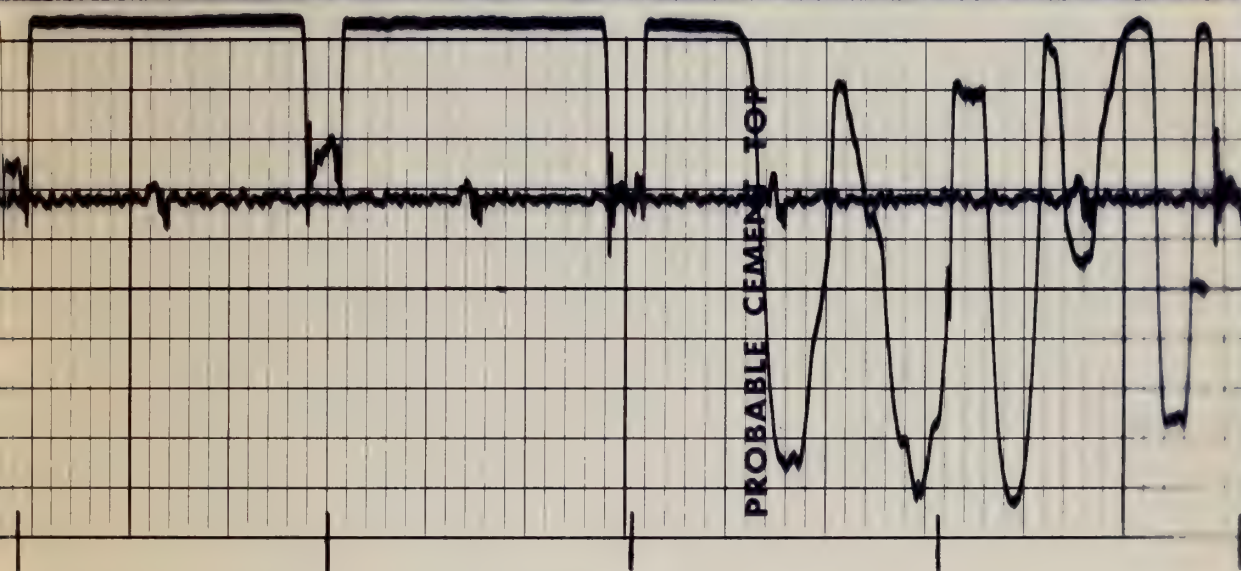
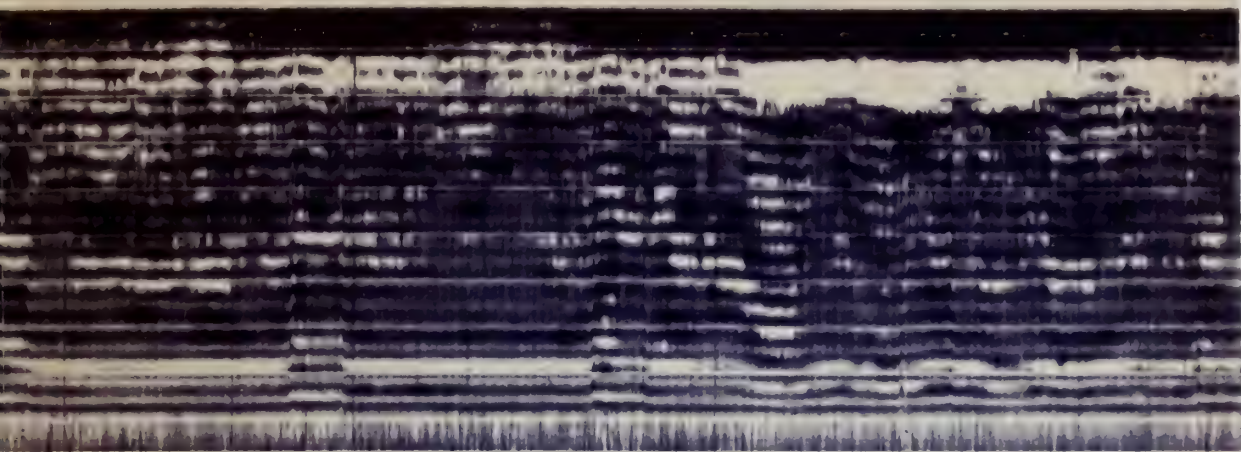


00

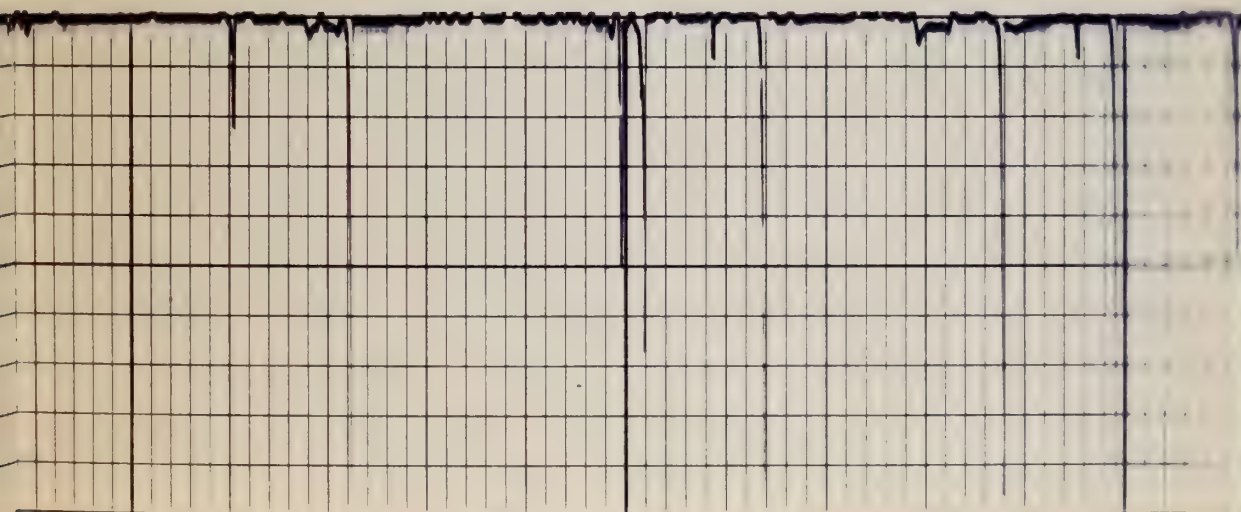


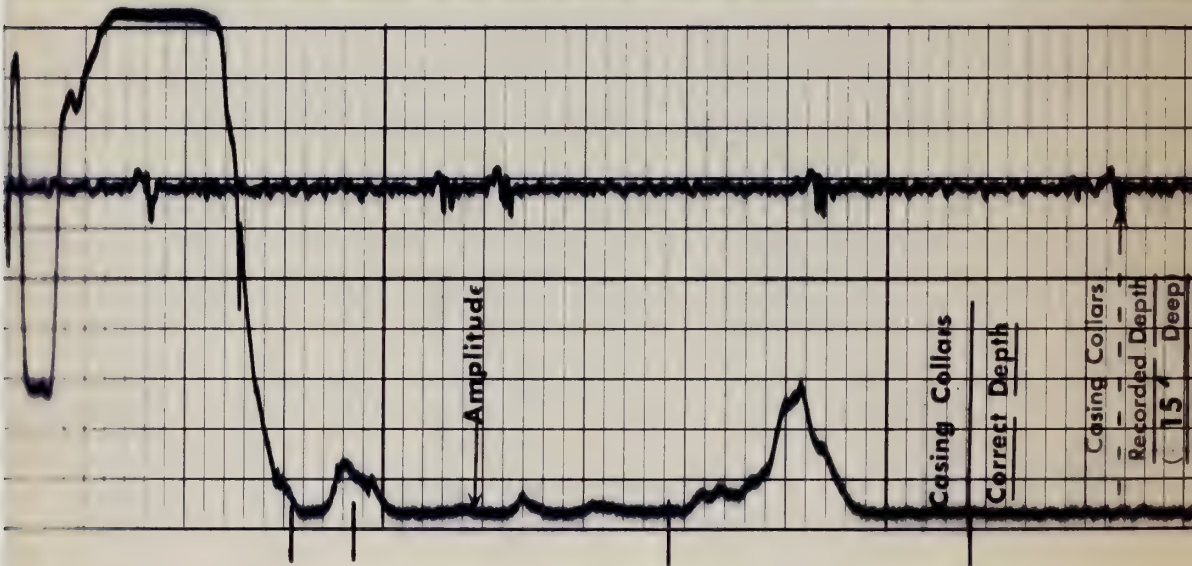
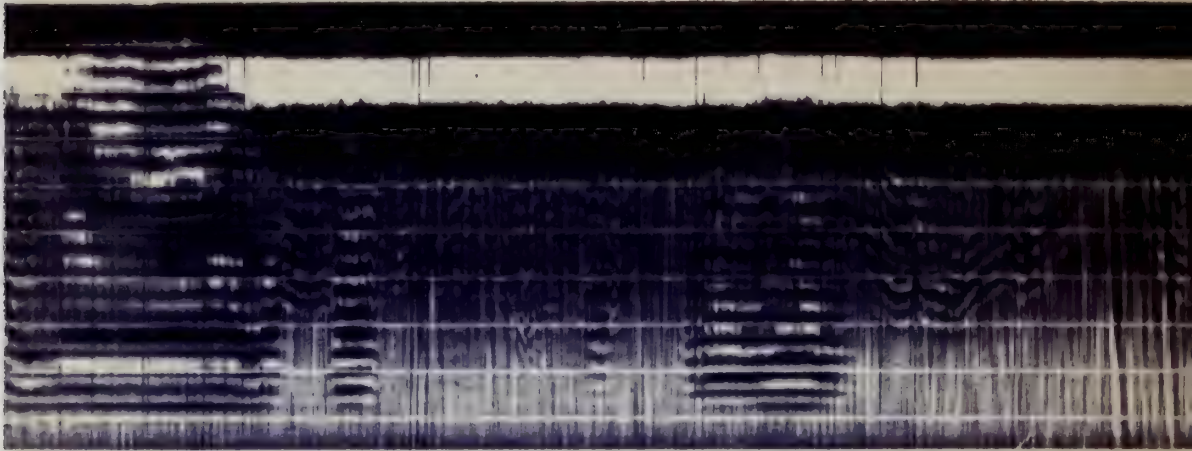
REPEAT SECTION - NO. 2 - SHORT STRING



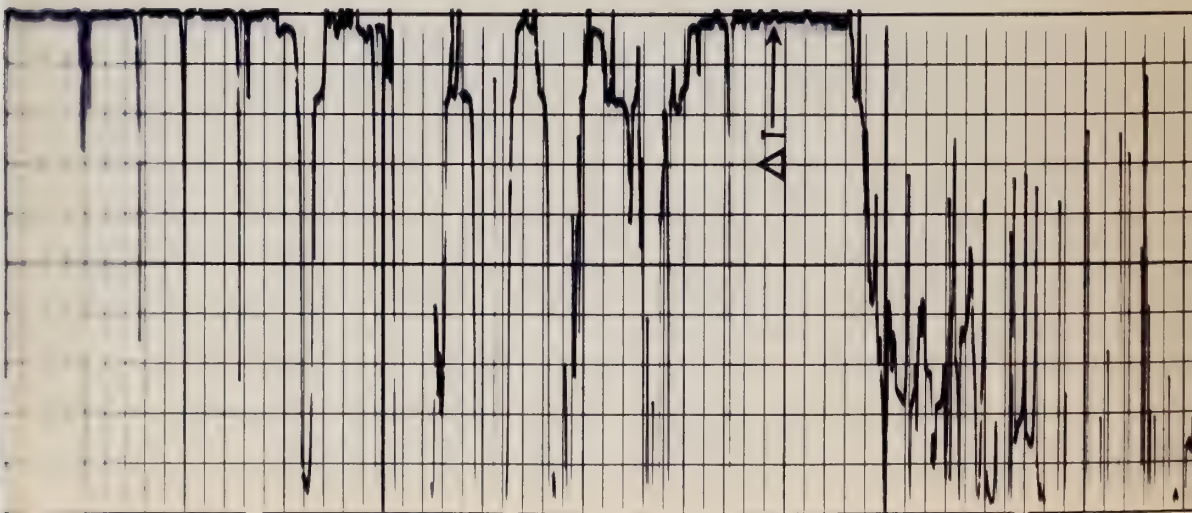


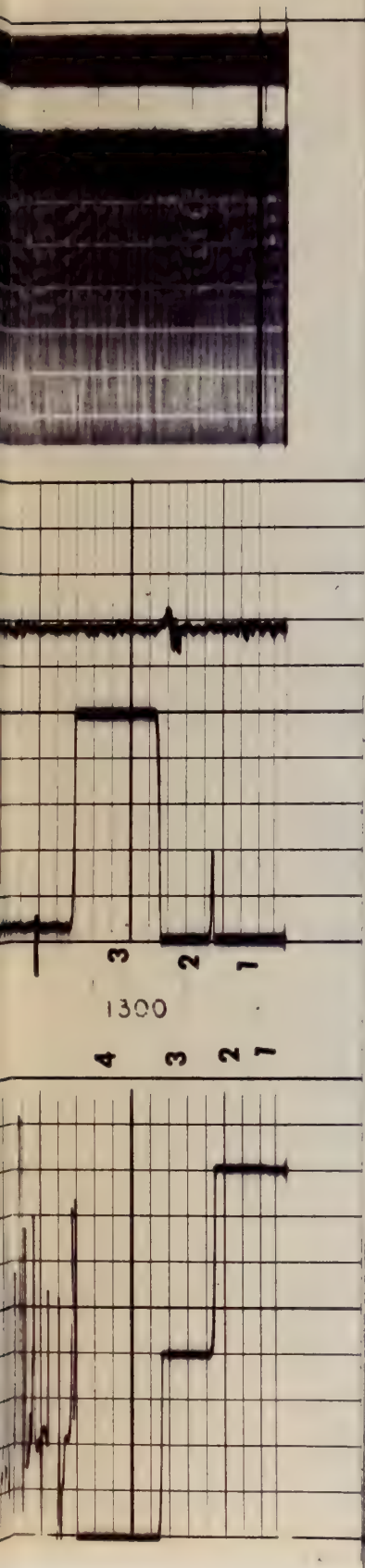
1100





1200





HERE

TRANSIT TIME

MICROSECONDS 200 SPACING 200

Casing Collars
Corrected Depth

CASING BOND

MILLIVOLTS 100

VARIABLE DENSITY

MICROSECONDS 5 FT. SPACING 1200

DEPTH

COMPANY ATLANTIC RICHFIELD COMPANY

WELL S.G. NO.17

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 2277-1495

SCHL. TD 2285-1503

DRLR TD 2305-1490

Elev:

KB ----

DF ----

GL 7036

CEMENT BOND CALIBRATION CODING

	Δt	AMPLITUDE
1.	MECHANICAL ZERO	MECHANICAL ZERO
2.	240 μ sec	ELECTRICAL ZERO
3.	320 μ sec	CALIBRATE
4.	400 μ sec	

COUNTY
 Per
 Loc
 Dri
 Dat
 Run
 Pipe
 Pipe
 Type
 Type
 Sc
 D
 Le
 Max
 Oper
 Reco
 With
 Bit
 6 3/4
 SWS-1521

Schlumberger

ORIENTED PERFORATING RECORD AND CASING COLLAR LOG

COUNTY <u>RIO BLANCO</u> FIELD or LOCATION <u>SORGHUM GULCH</u> WELL <u>S.G. NO. 17</u> COMPANY <u>ATLANTIC RICHFIELD COMPANY</u>	COMPANY <u>ATLANTIC RICHFIELD COMPANY</u>	
	WELL <u>S.G. NO. 17</u>	
	FIELD <u>SORGHUM GULCH</u>	
	COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u>	
Location: <u>436' FWL & 181' FSL</u>		Other Services: <u>CBL-VDL-1</u> <u>CBL-VDL-2</u> <u>PDC-GR-1</u> <u>PDC-TH-2</u>
Sec. <u>16</u> Twp. <u>3S</u> Rge. <u>46 W</u>		

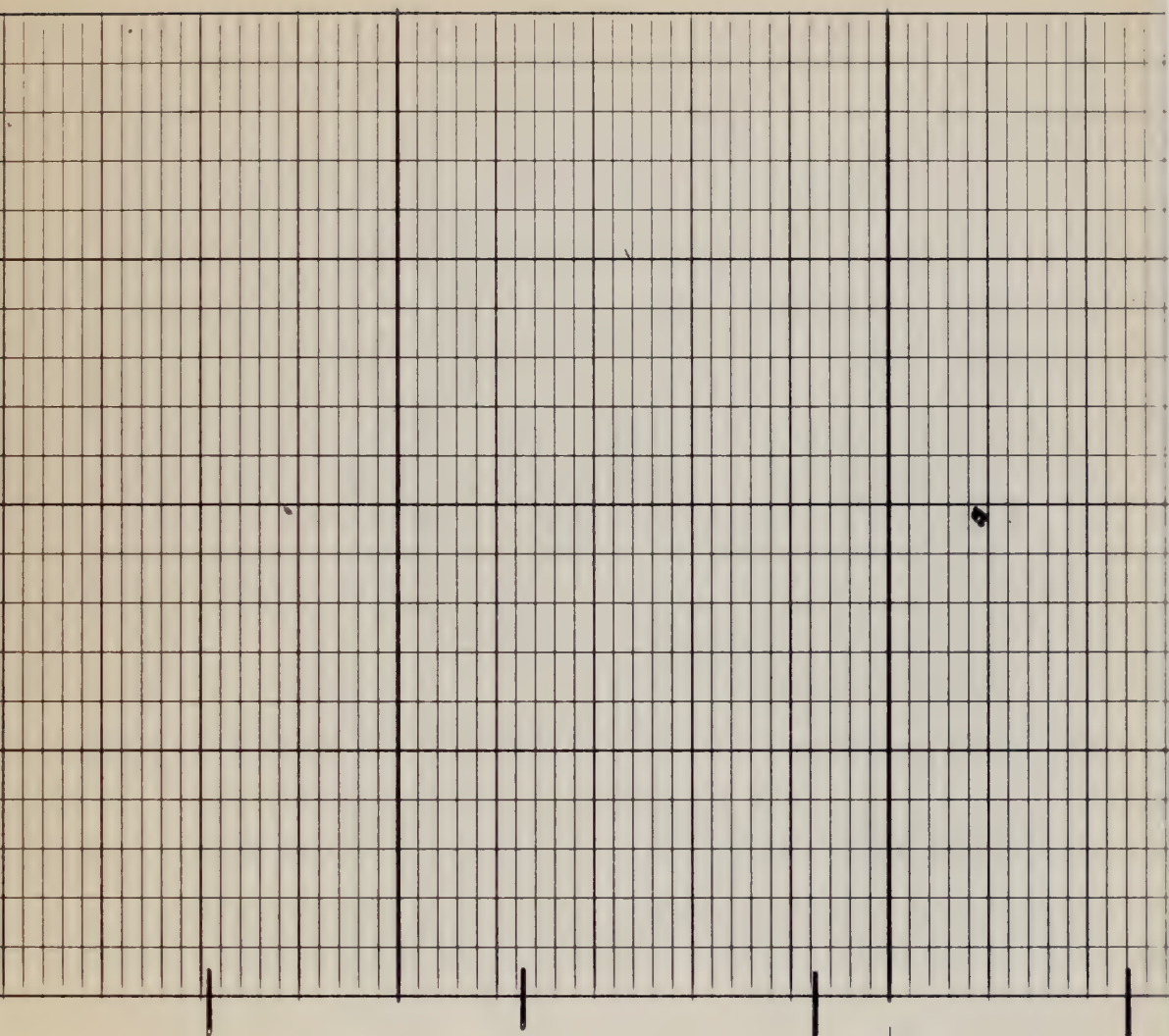
Permanent Datum: <u>GROUND LEVEL</u> ; Elev.: <u>7036</u>	Elev.: K.B. <u>----</u>
Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum	D.F. <u>----</u>
Drilling Measured From <u>GL</u>	G.L. <u>7036</u>

Date	<u>2-23/3-2-75</u>
Run No.	<u>ONE</u>
Pipe String No.	<u>1-2</u>
Pipe String Ident.	<u>LONG-SHORT</u>
Type Orienting	<u>POWERED</u>
Type fluid in hole	<u>WATER</u>
Salinity, PPM Cl.	<u>-----</u>
Density	<u>-----</u>
Level	<u>FULL</u>
Max rec. temp., deg F.	<u>-----</u>
Operating rig time	<u>68 HOURS</u>
Recorded by	<u>ST. AUBYN</u>
Witnessed by	<u>MR. TAIT</u>

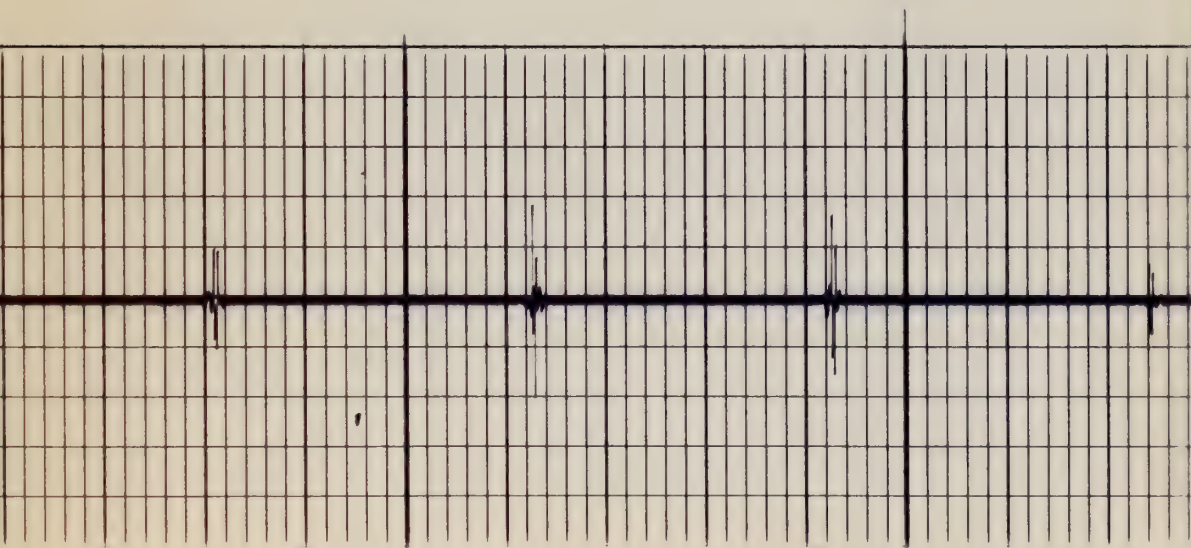
BORE-HOLE RECORD			CEMENTING RECORD			
Bit	From	To	Type	Wgt.	From	To
6 3/4	56	2460	Primary	HOWCO	2335	1110
			THIXATROPER			
			Squeeze			

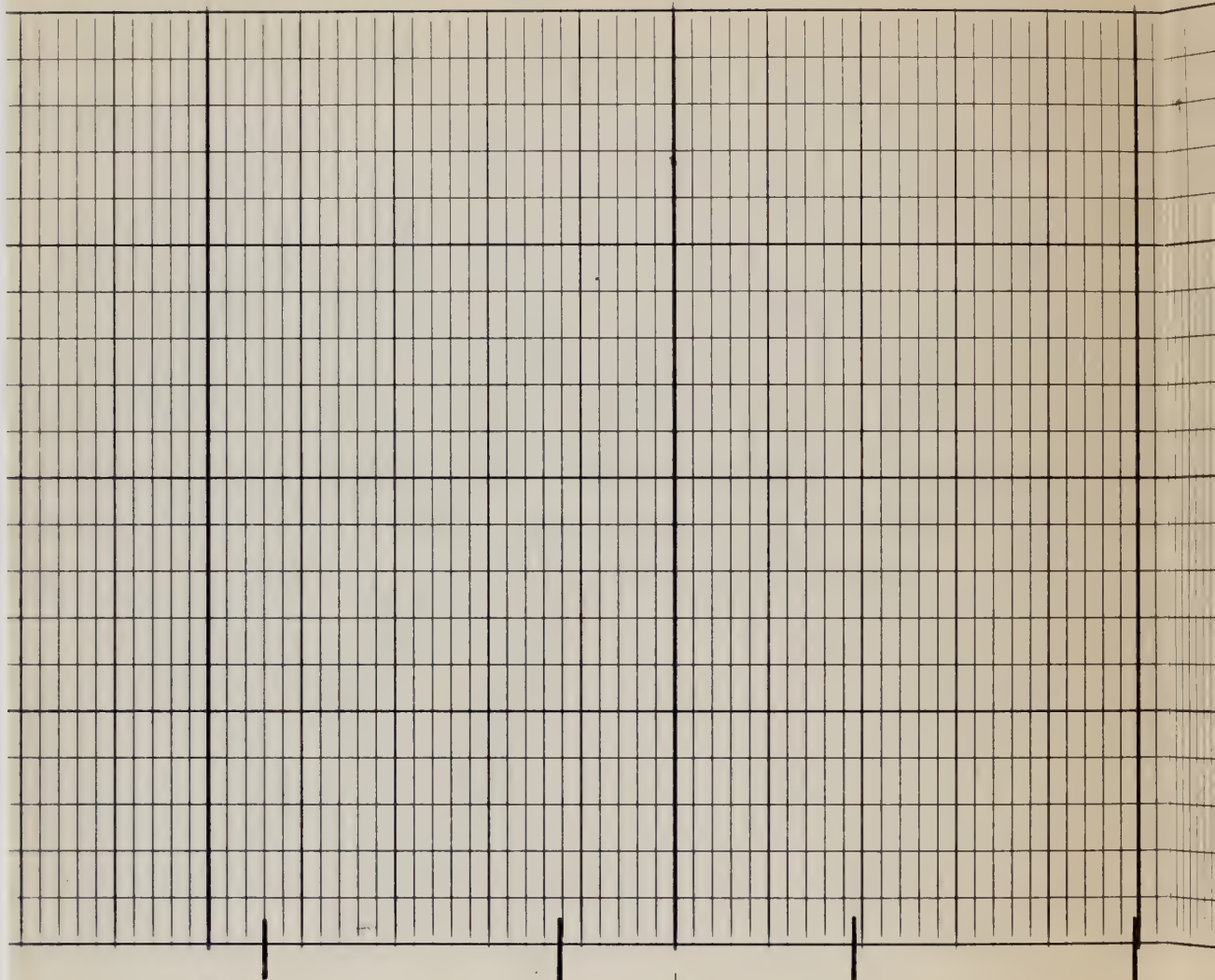
The well name, location and borehole reference data were furnished by the customer

FOLD HERE

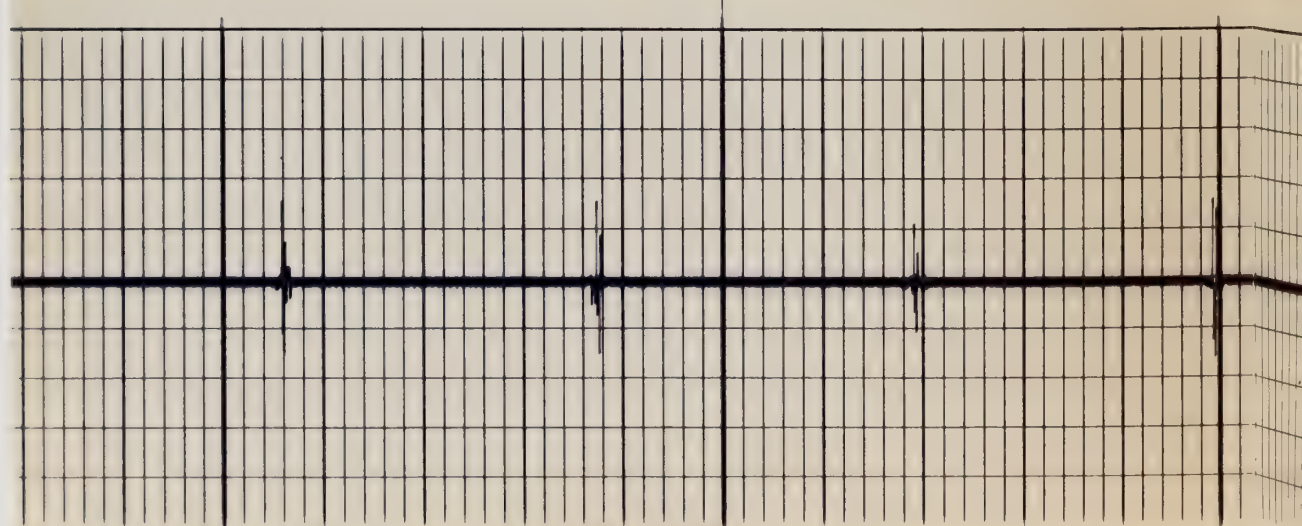


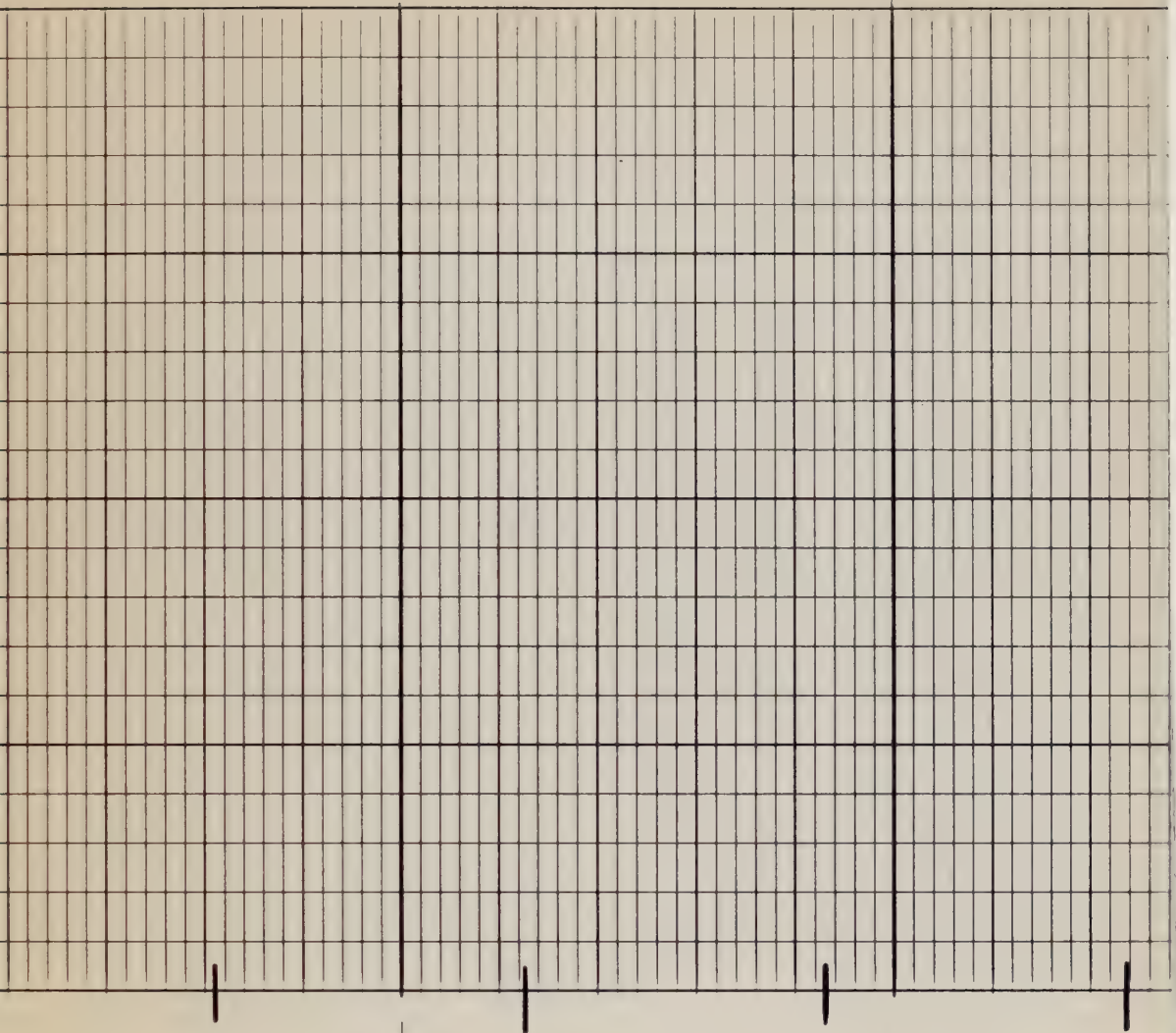
200



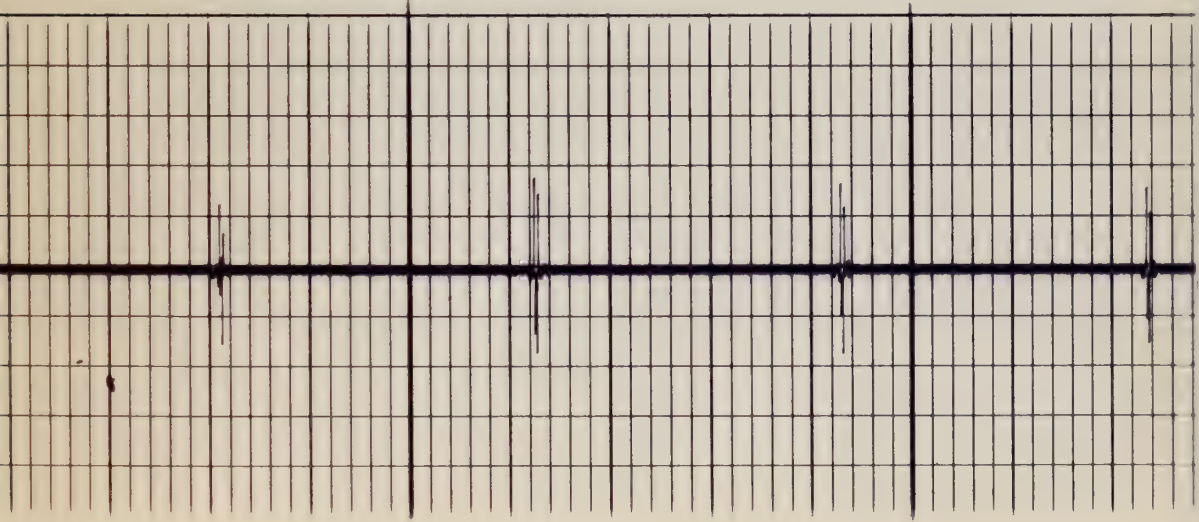


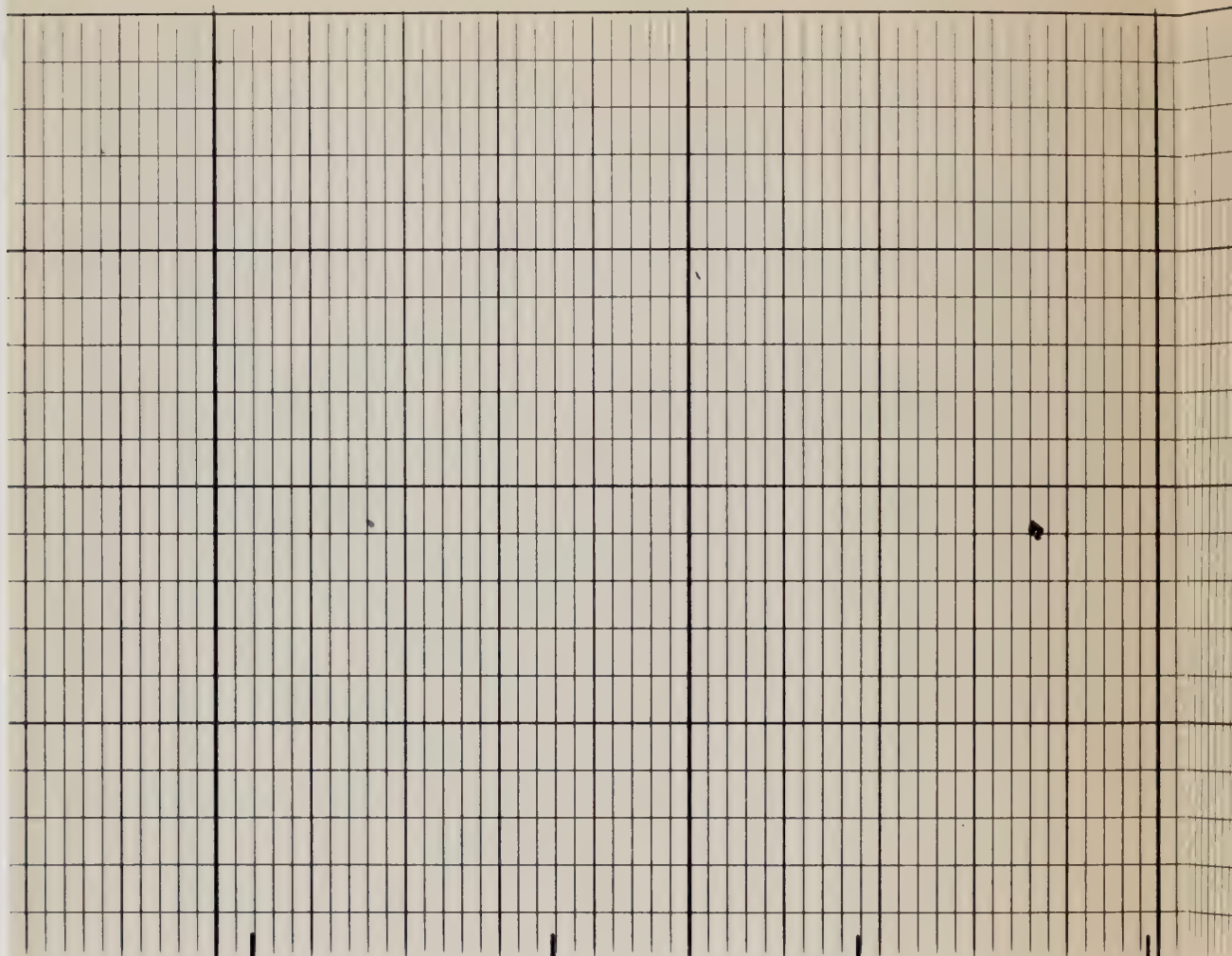
200





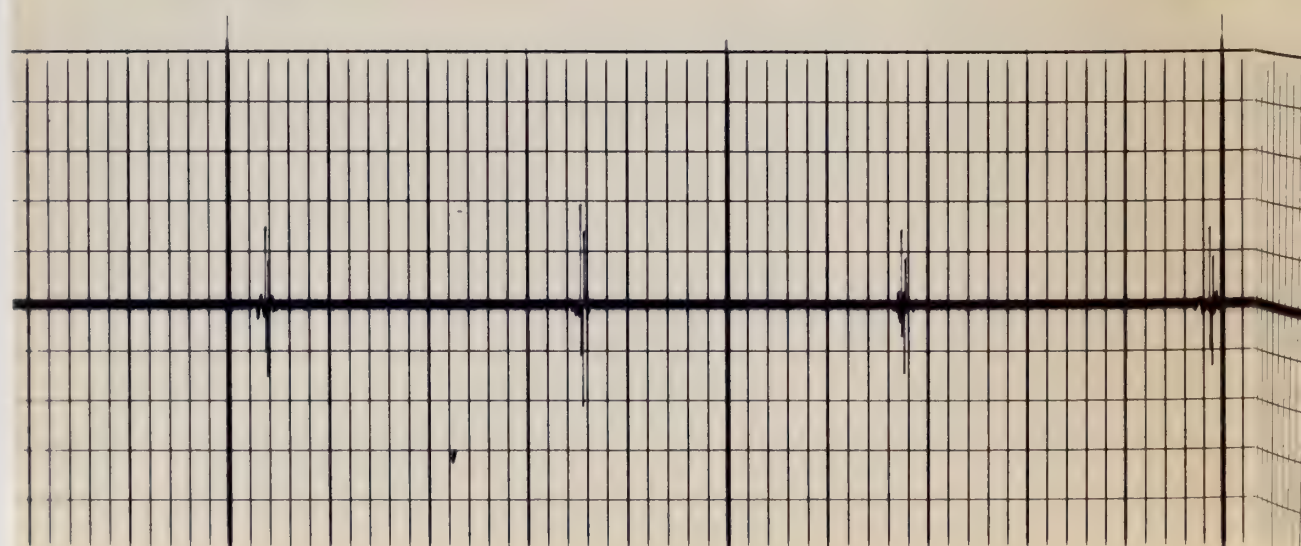
300

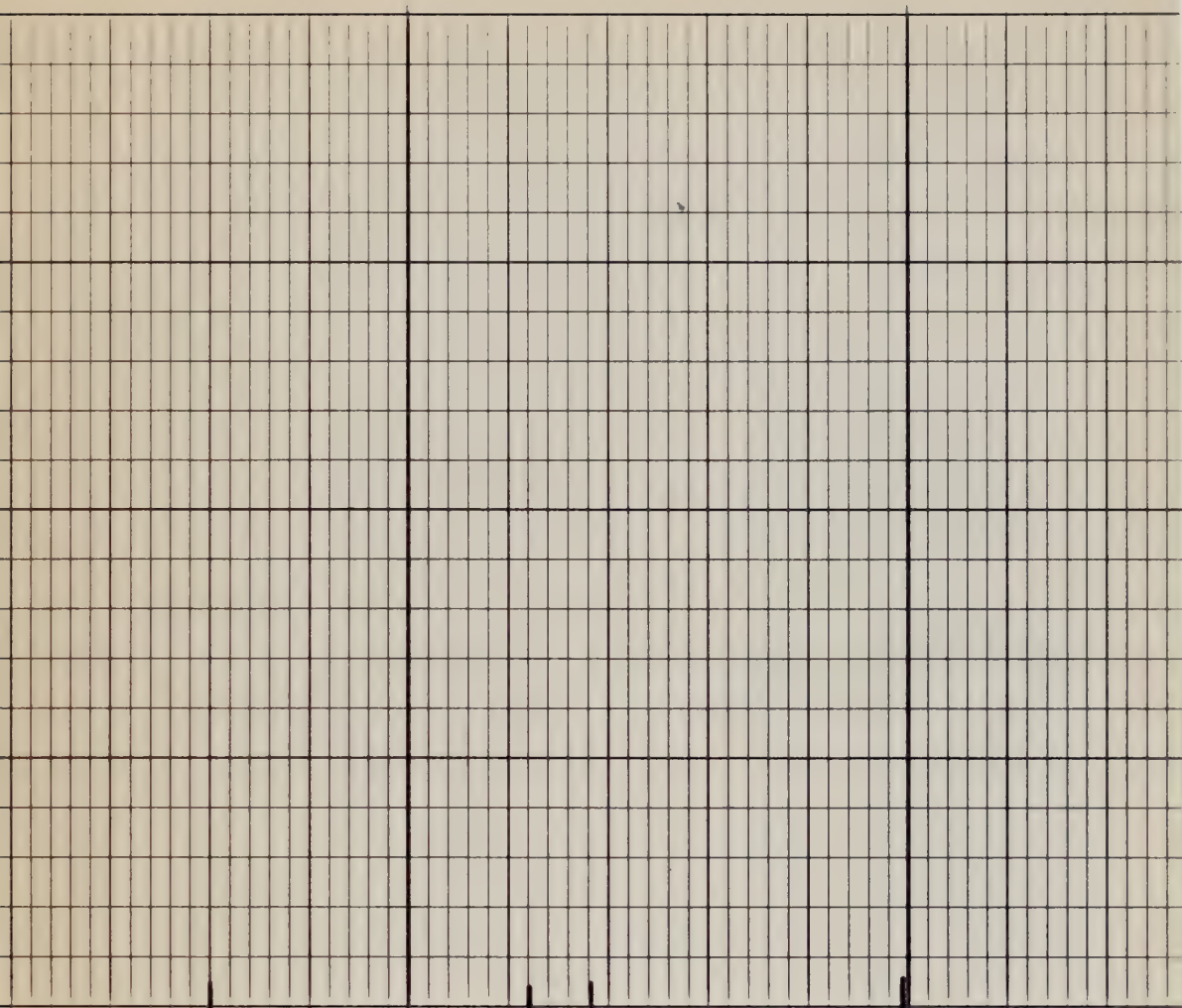




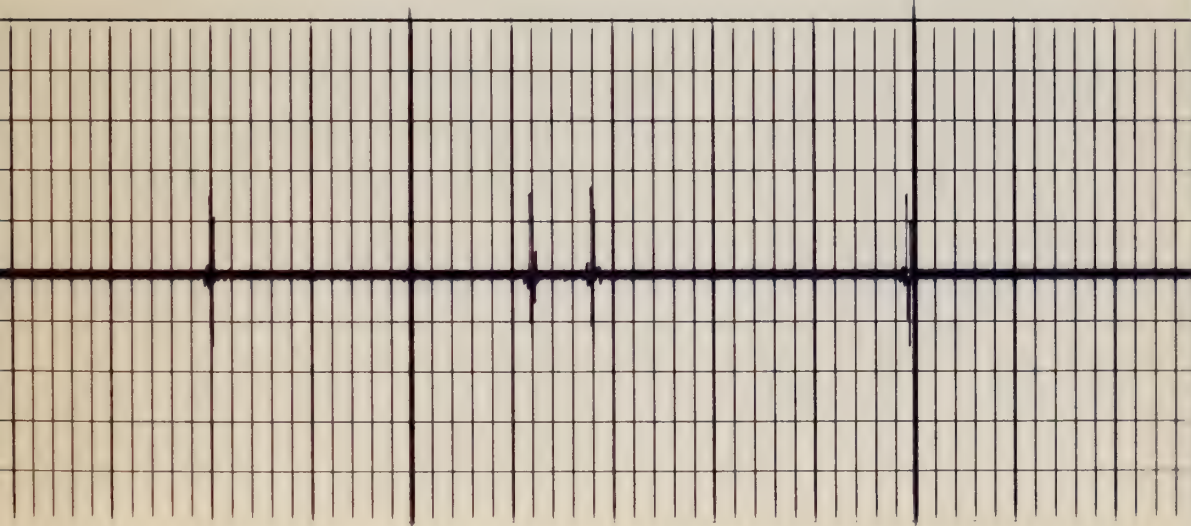
1400

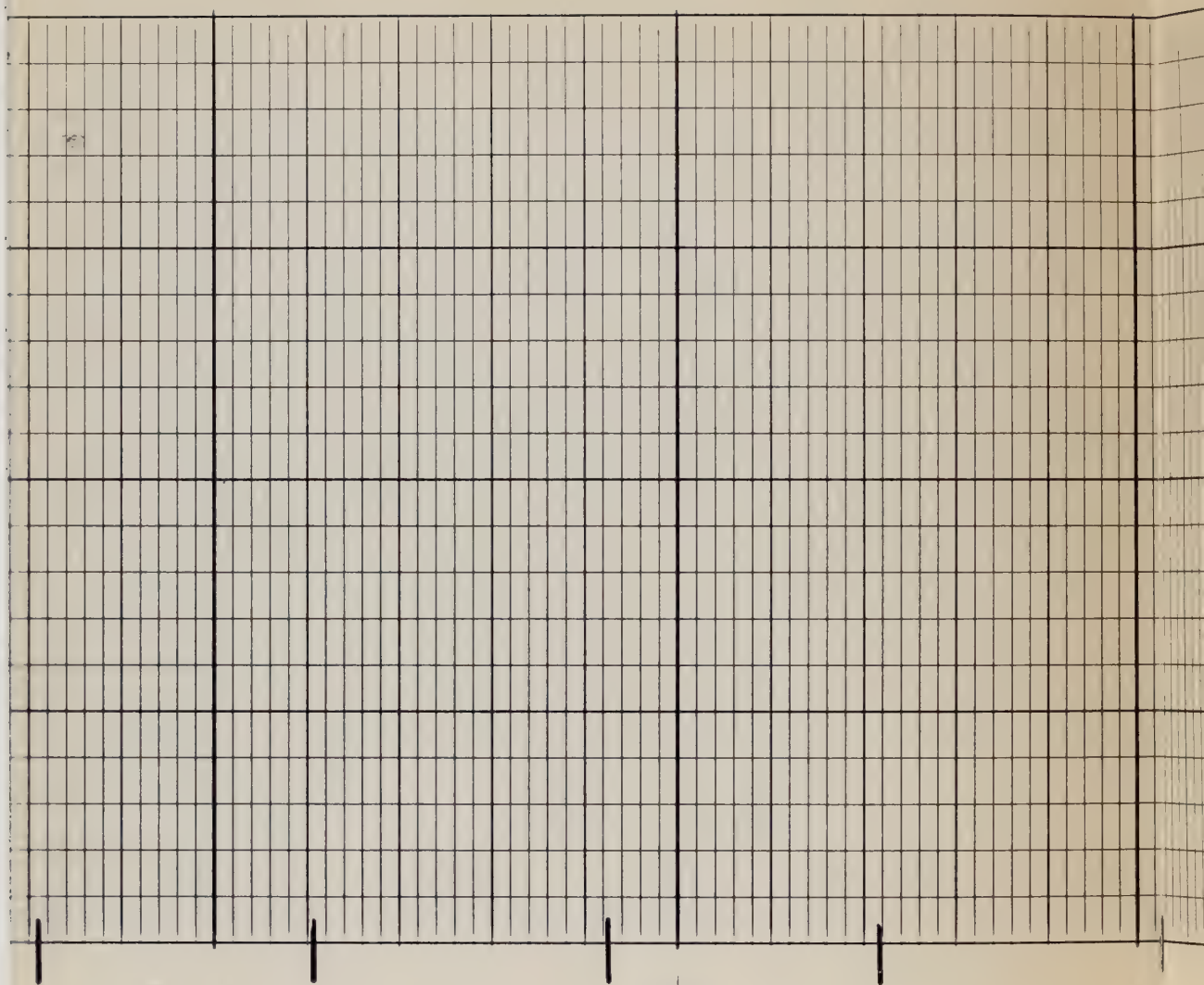
1500



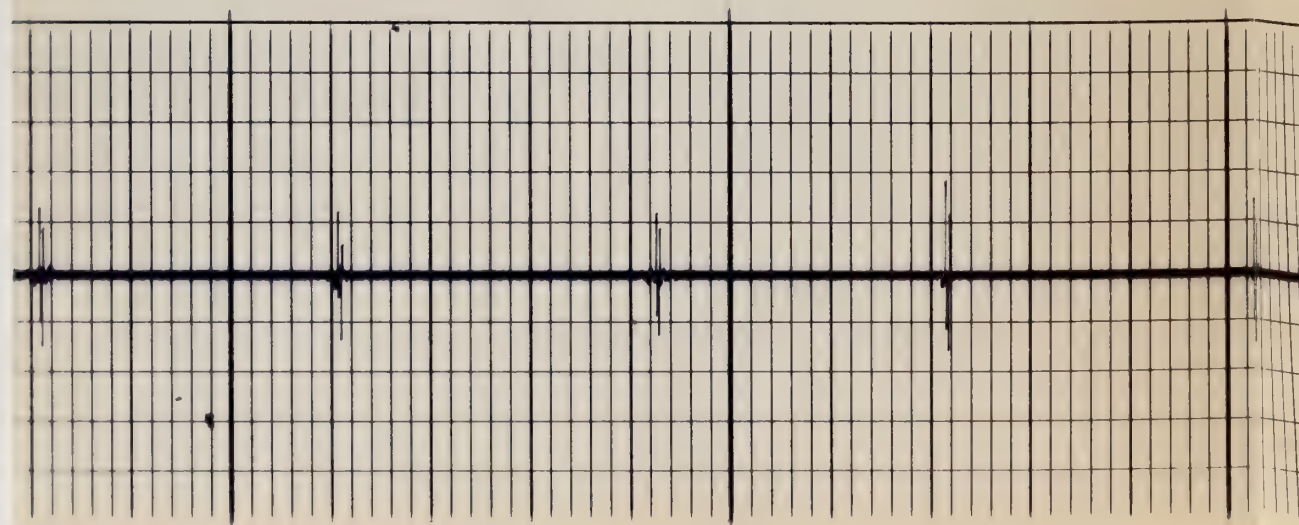


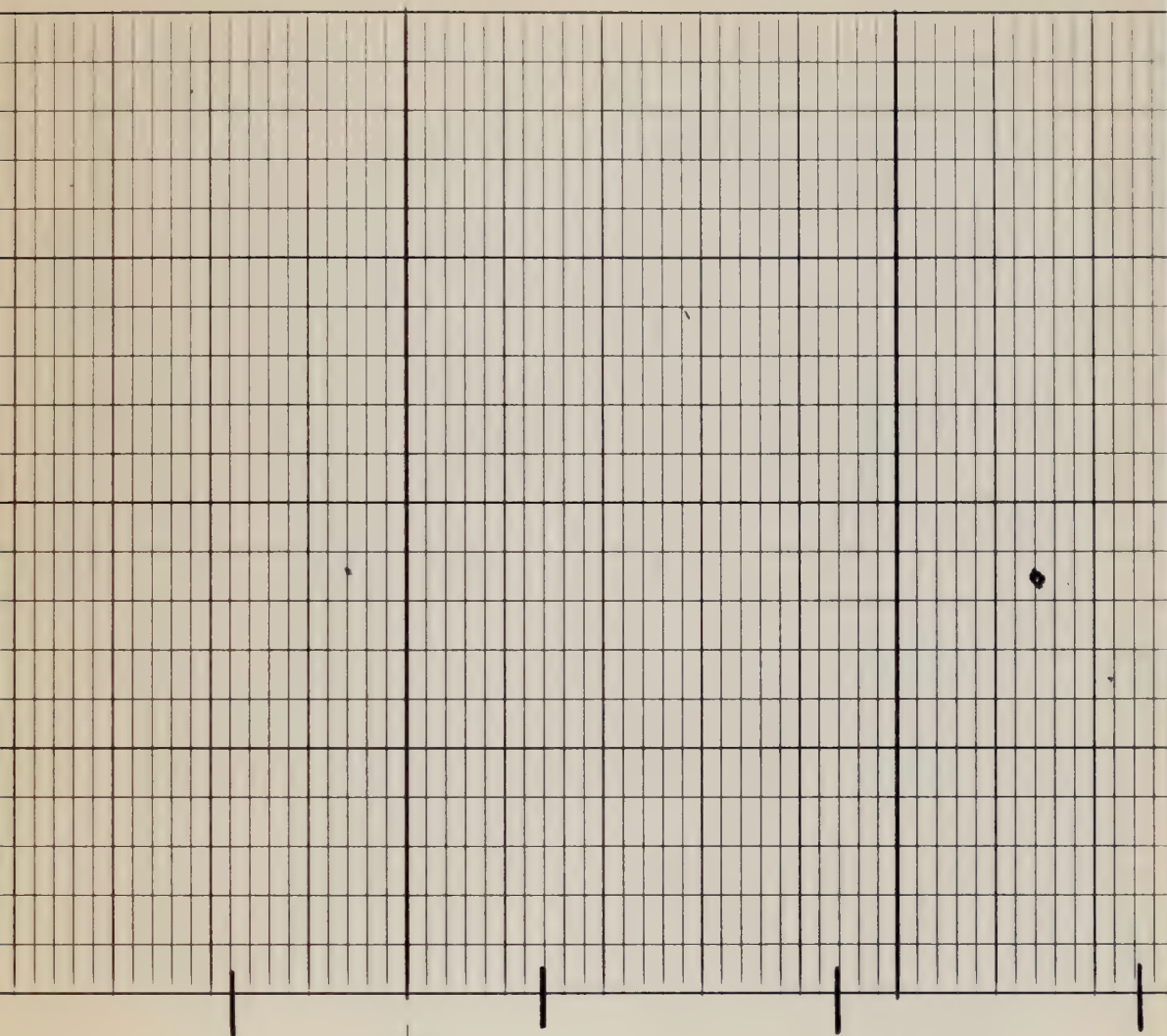
1500



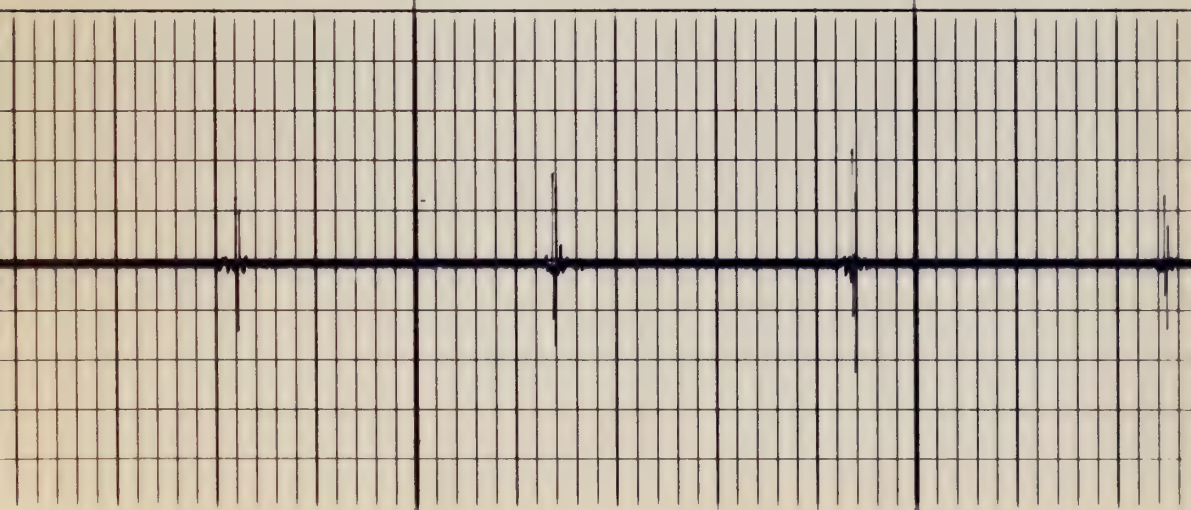


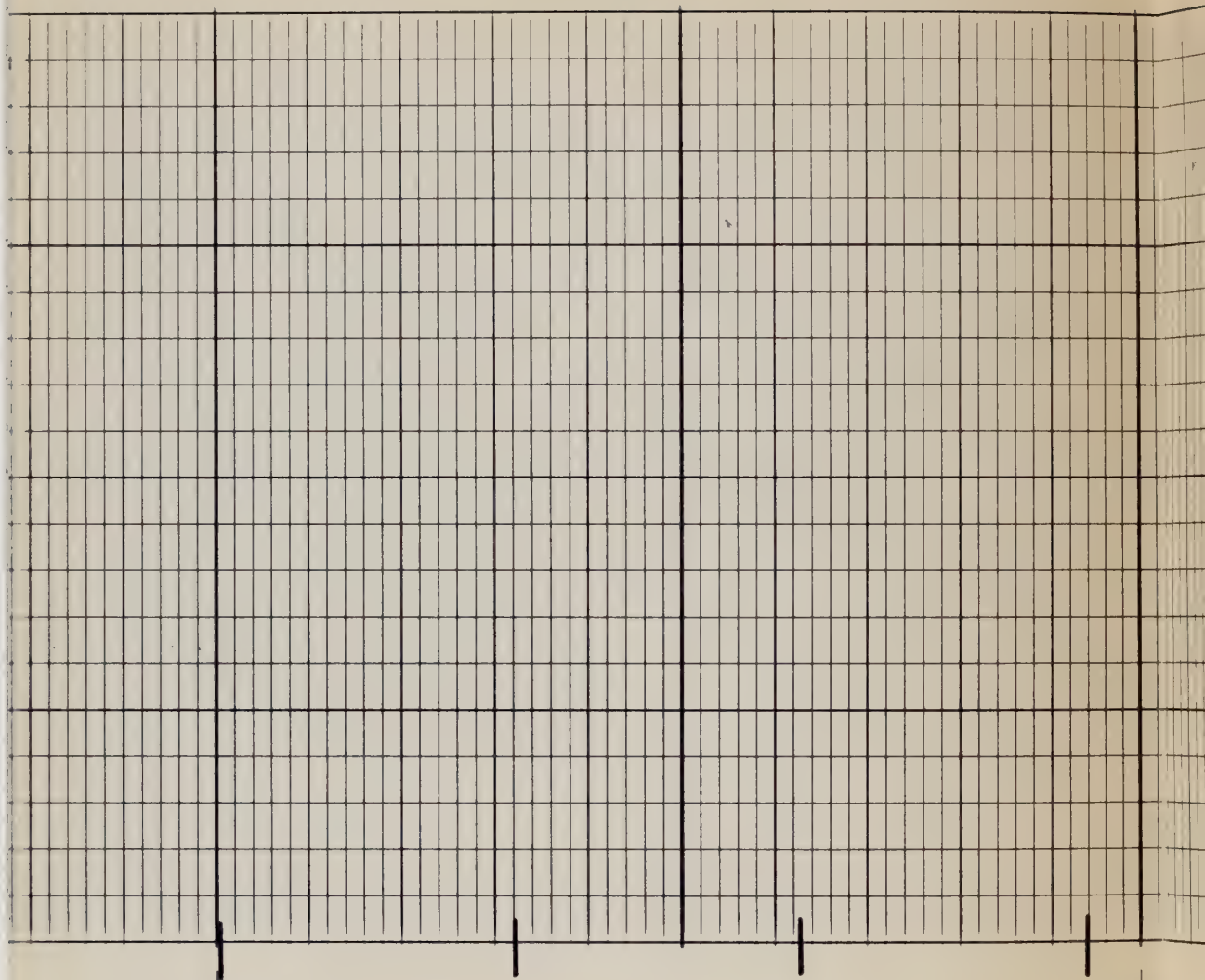
1700





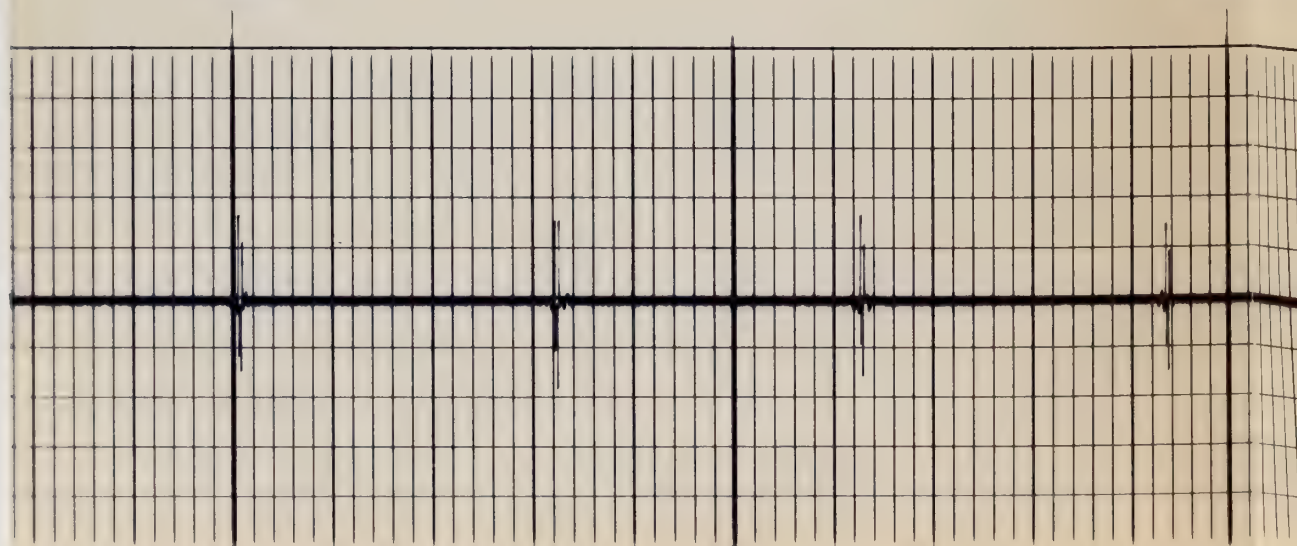
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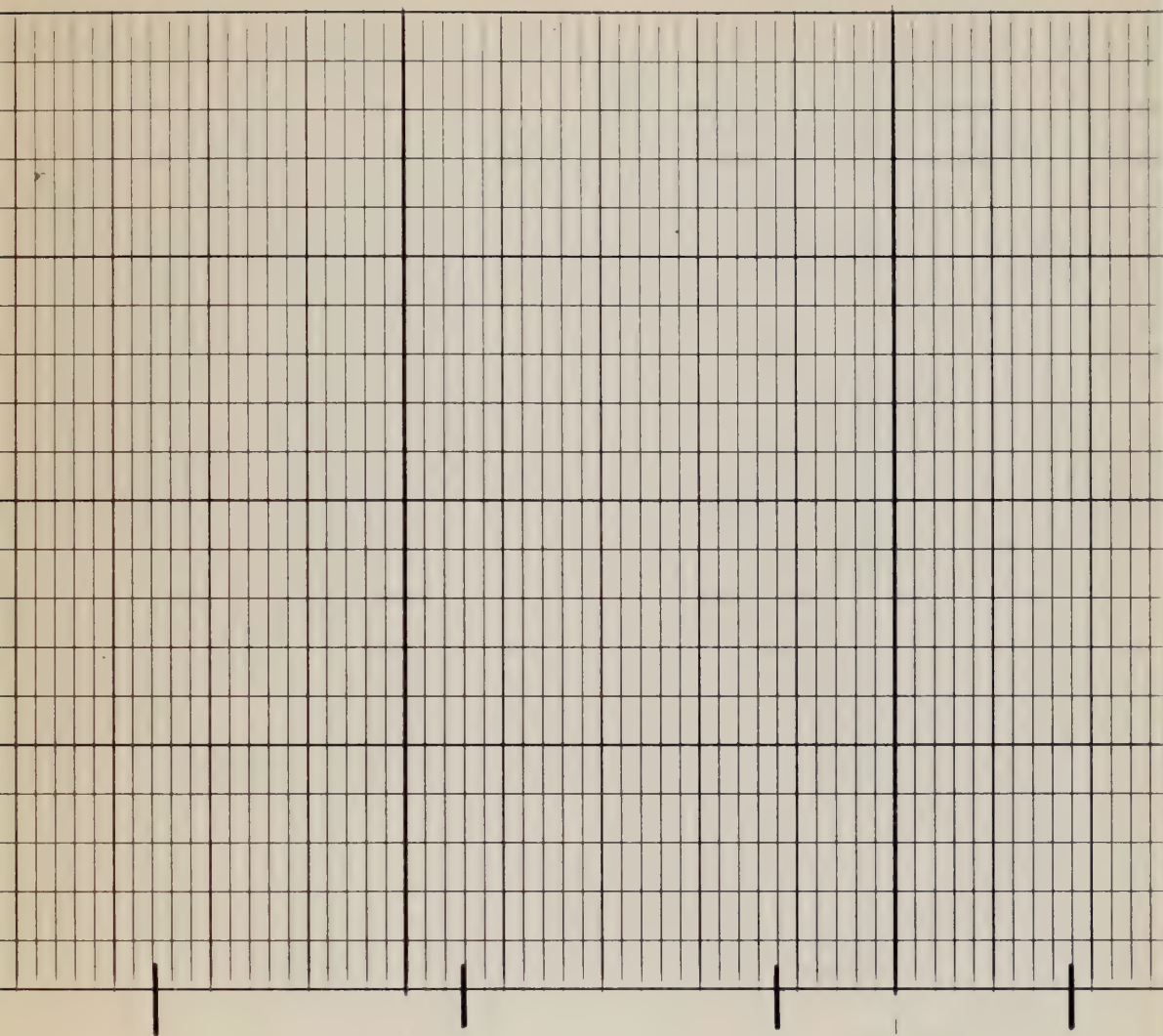




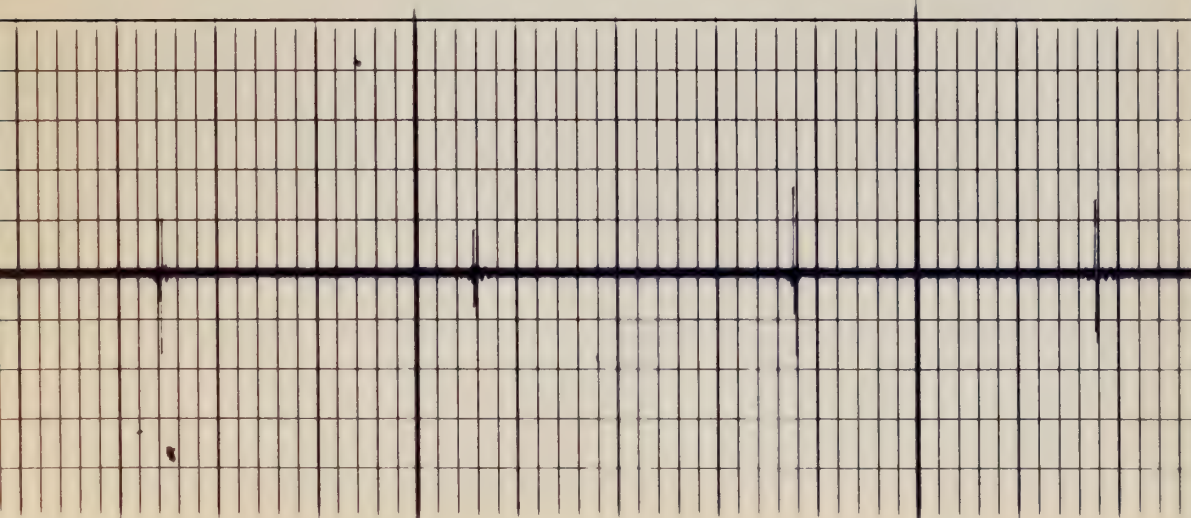
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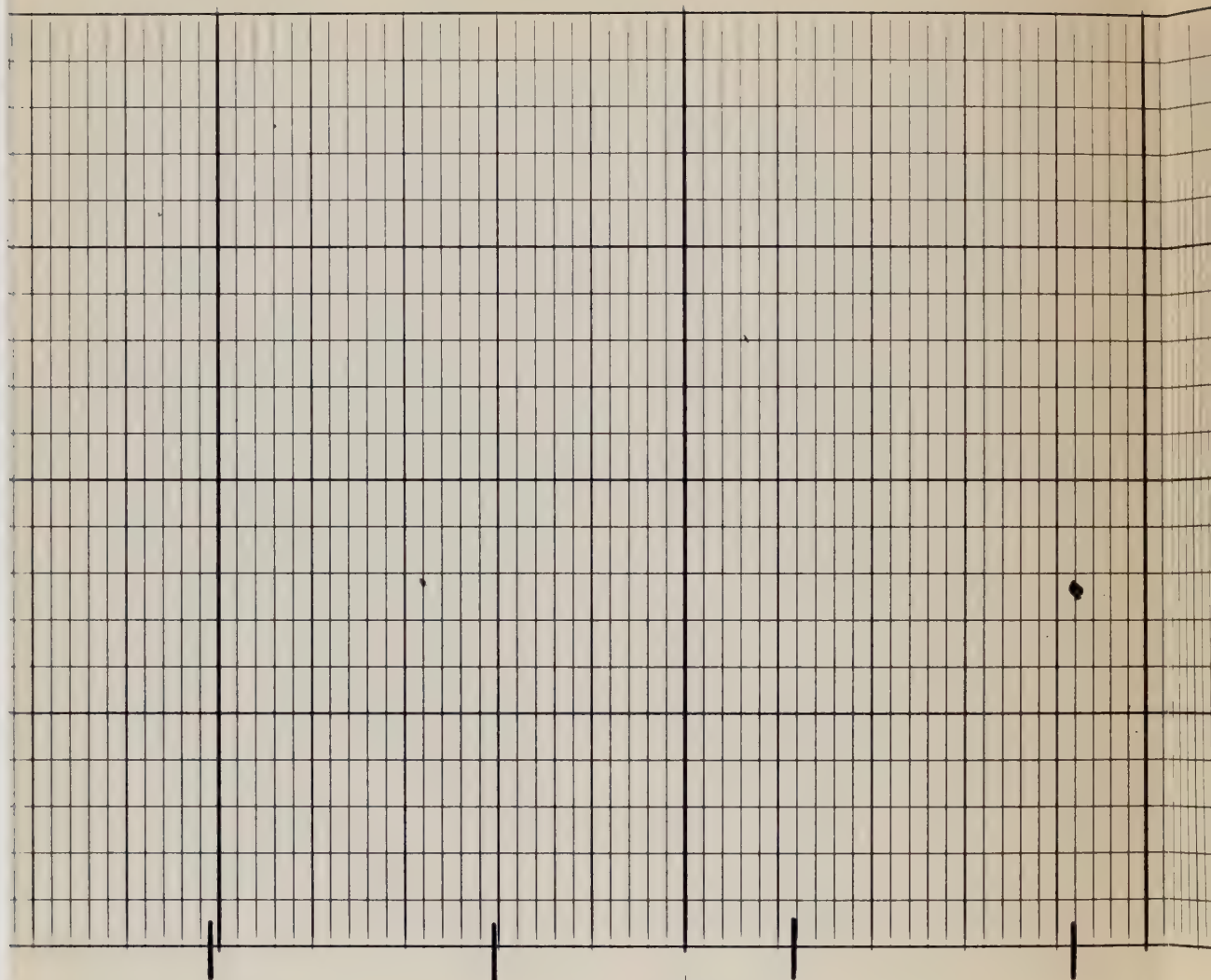
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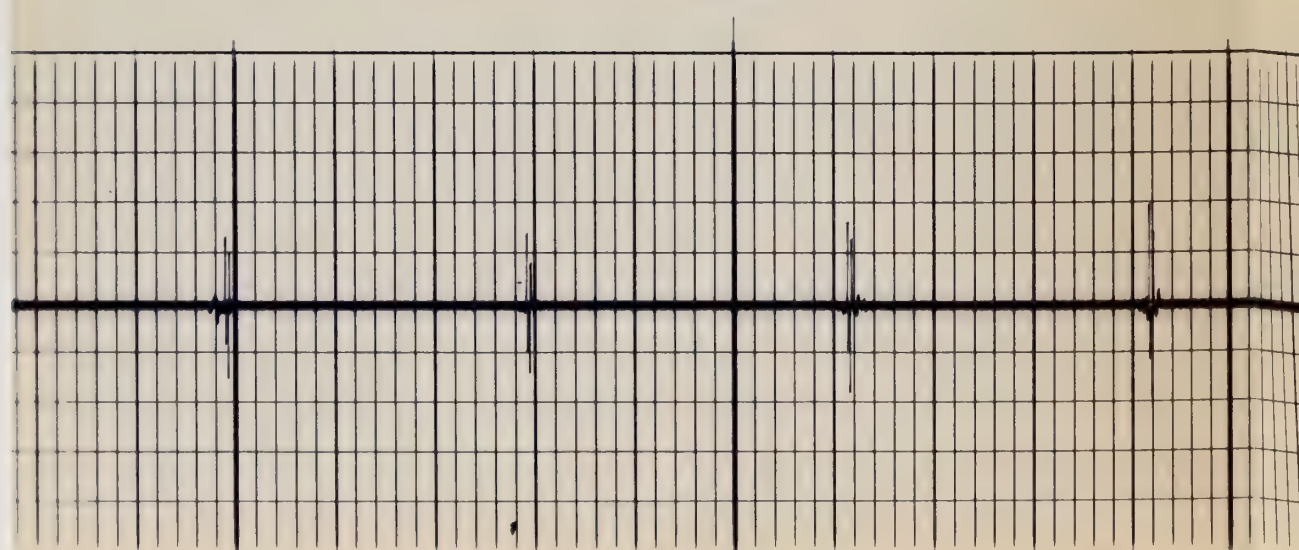


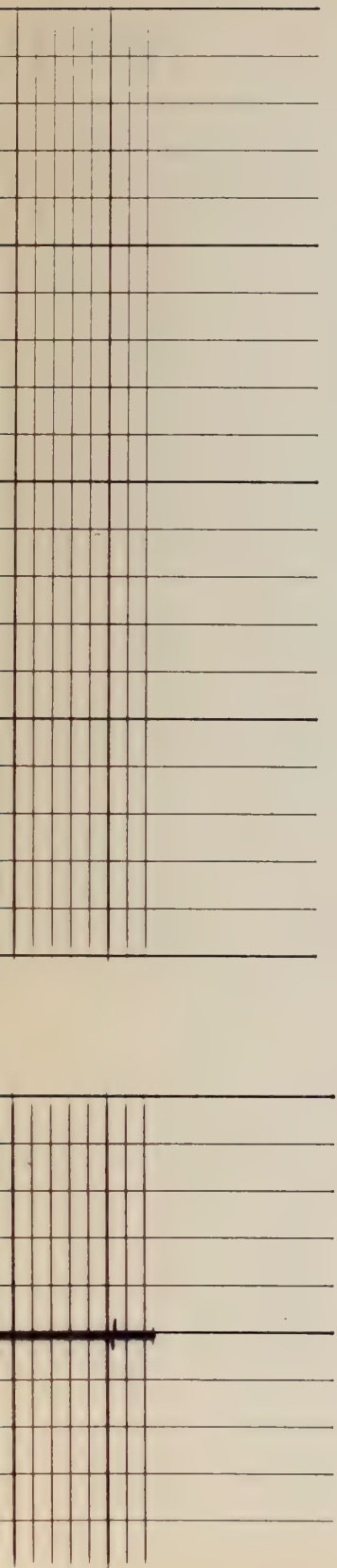
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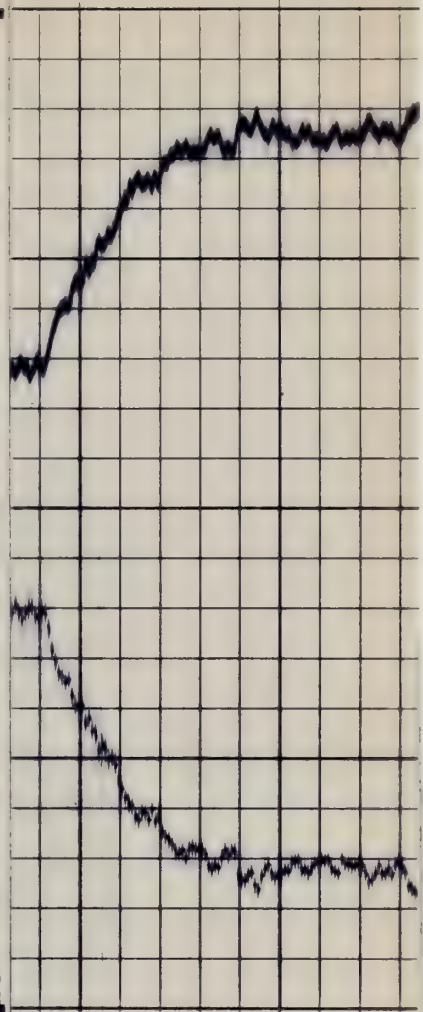
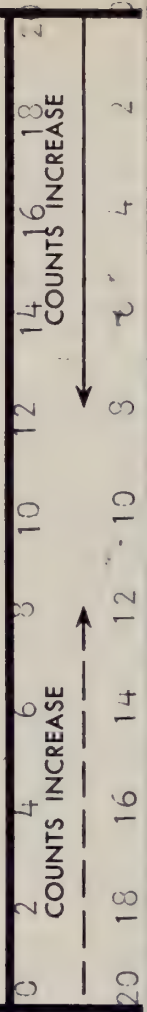
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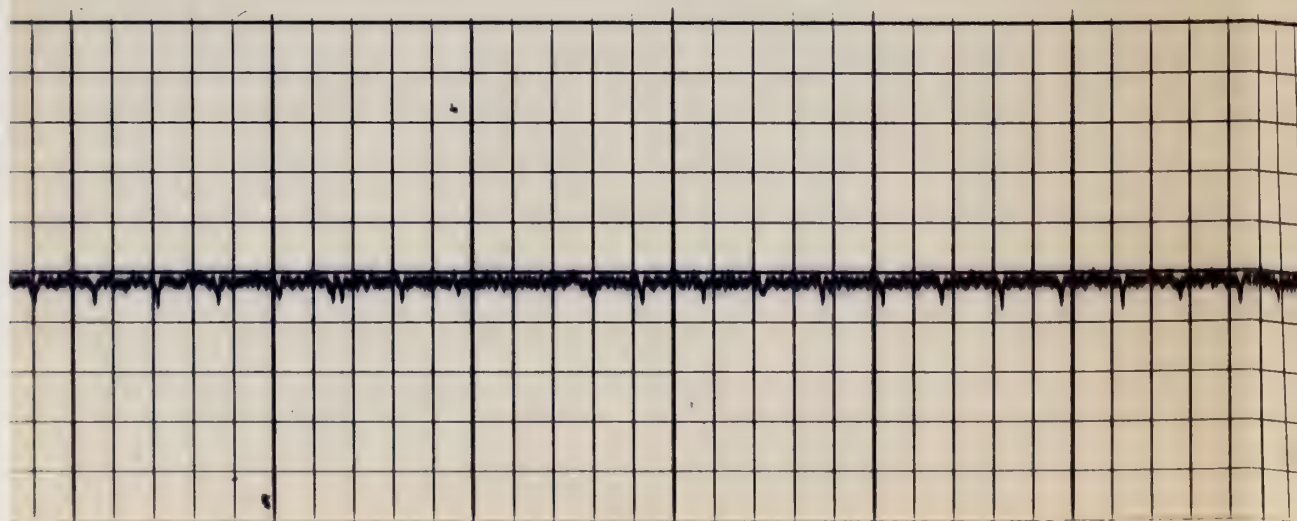
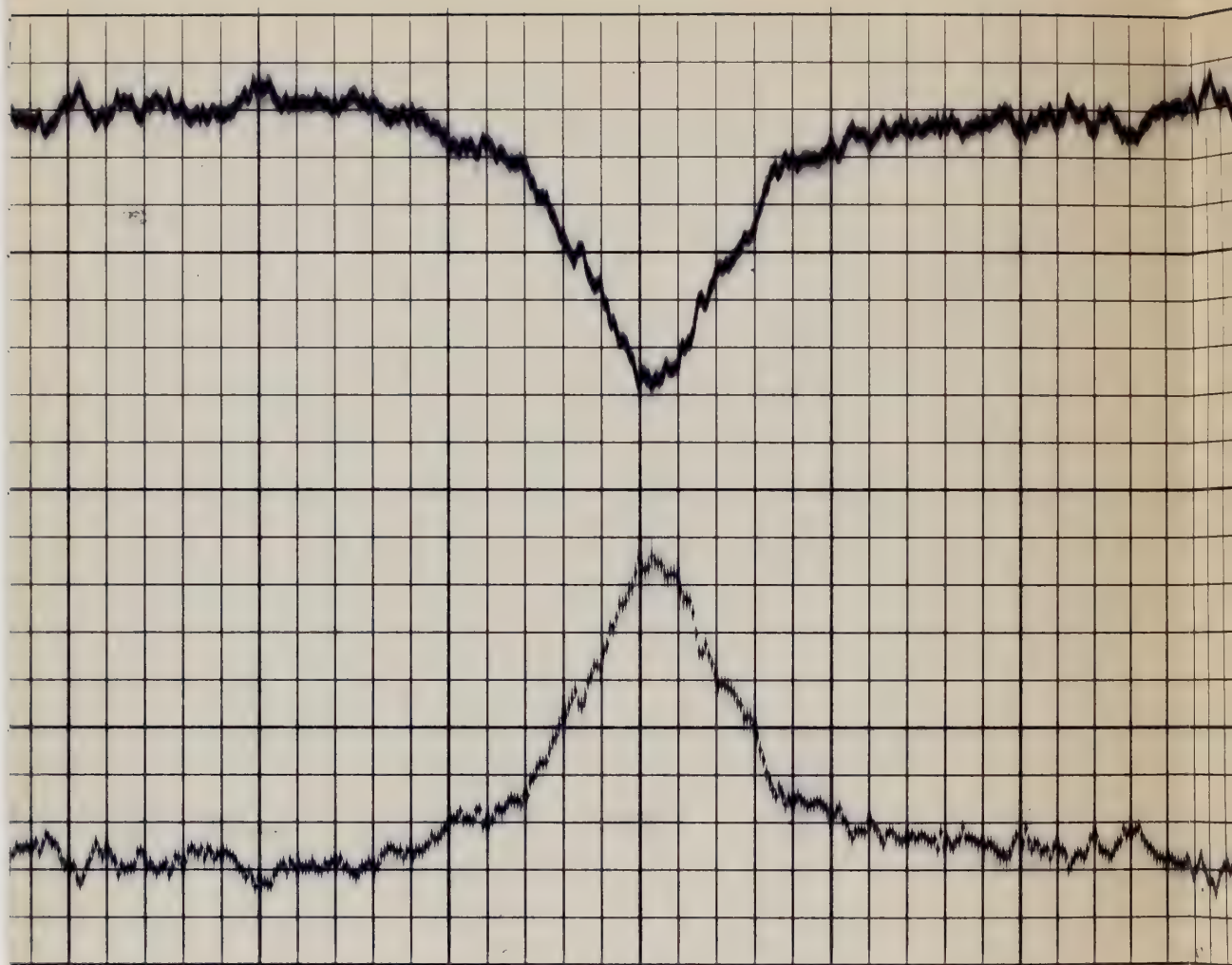


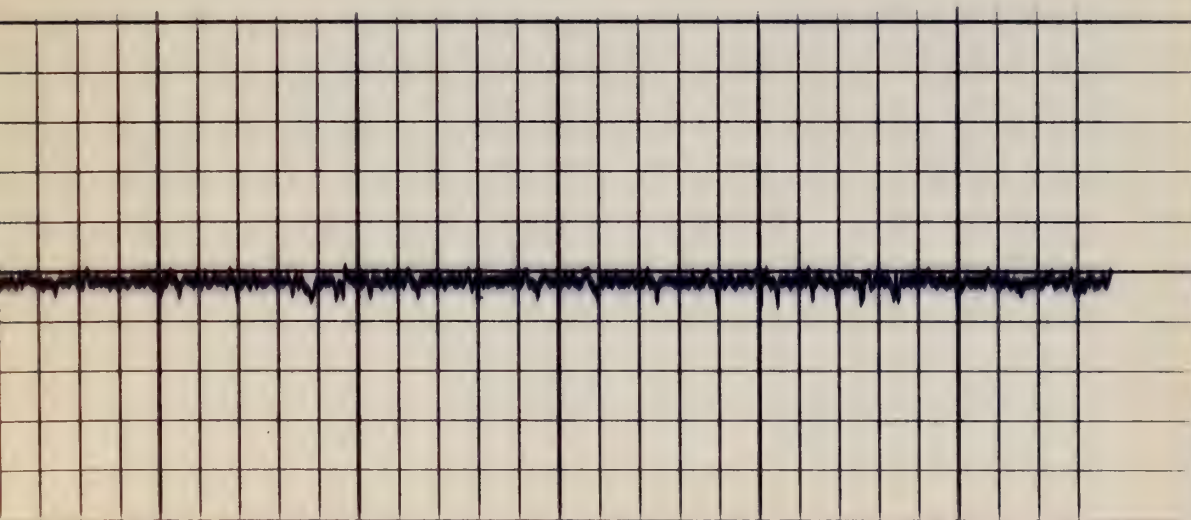
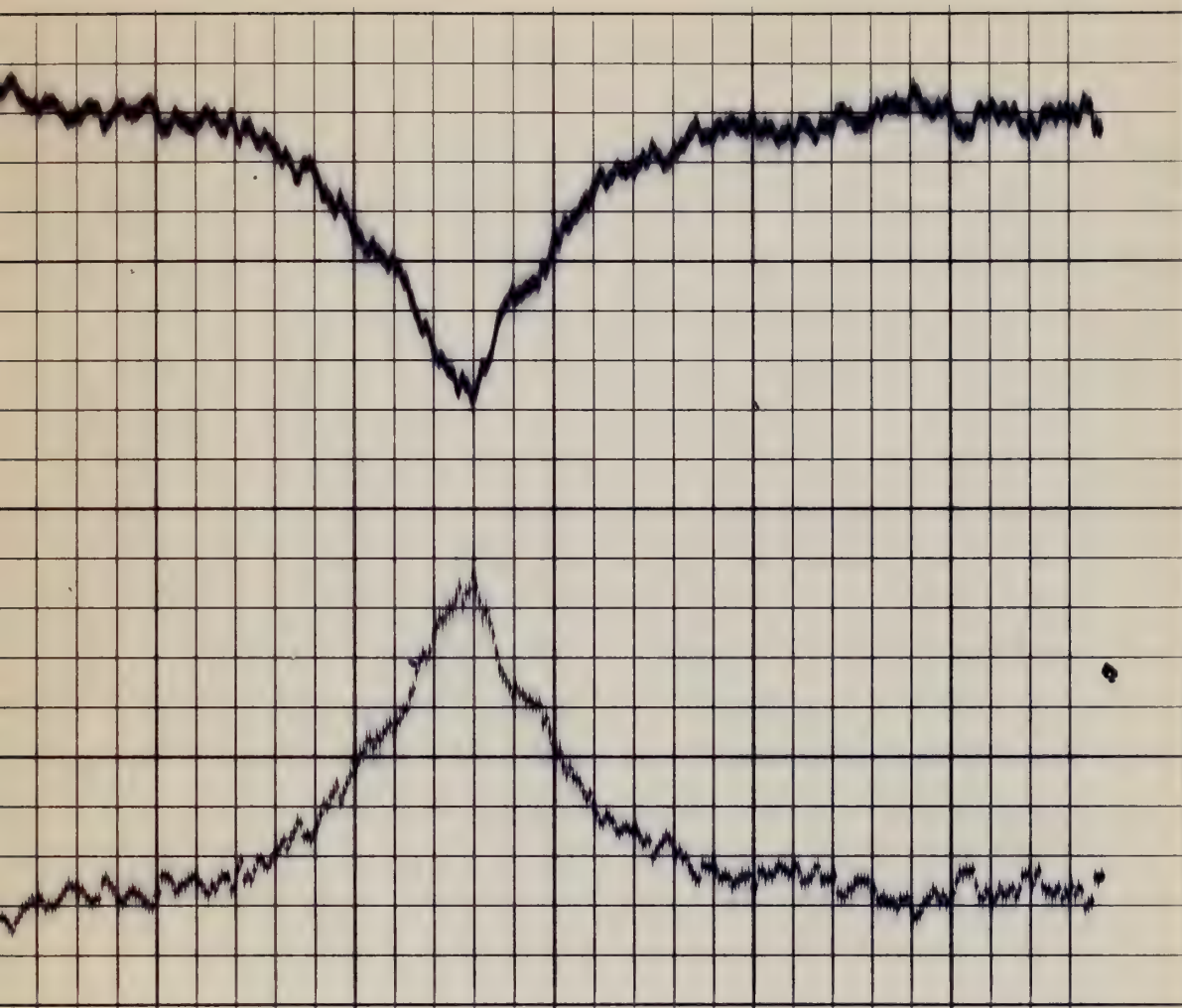
INDEXING
RECORD

RADIO-ORIENTATION
RECORD



TYPICAL RECORD FOR
NO. 1-LONG STRING
MADE FROM ORIENTATION
OF GUN NO. 1

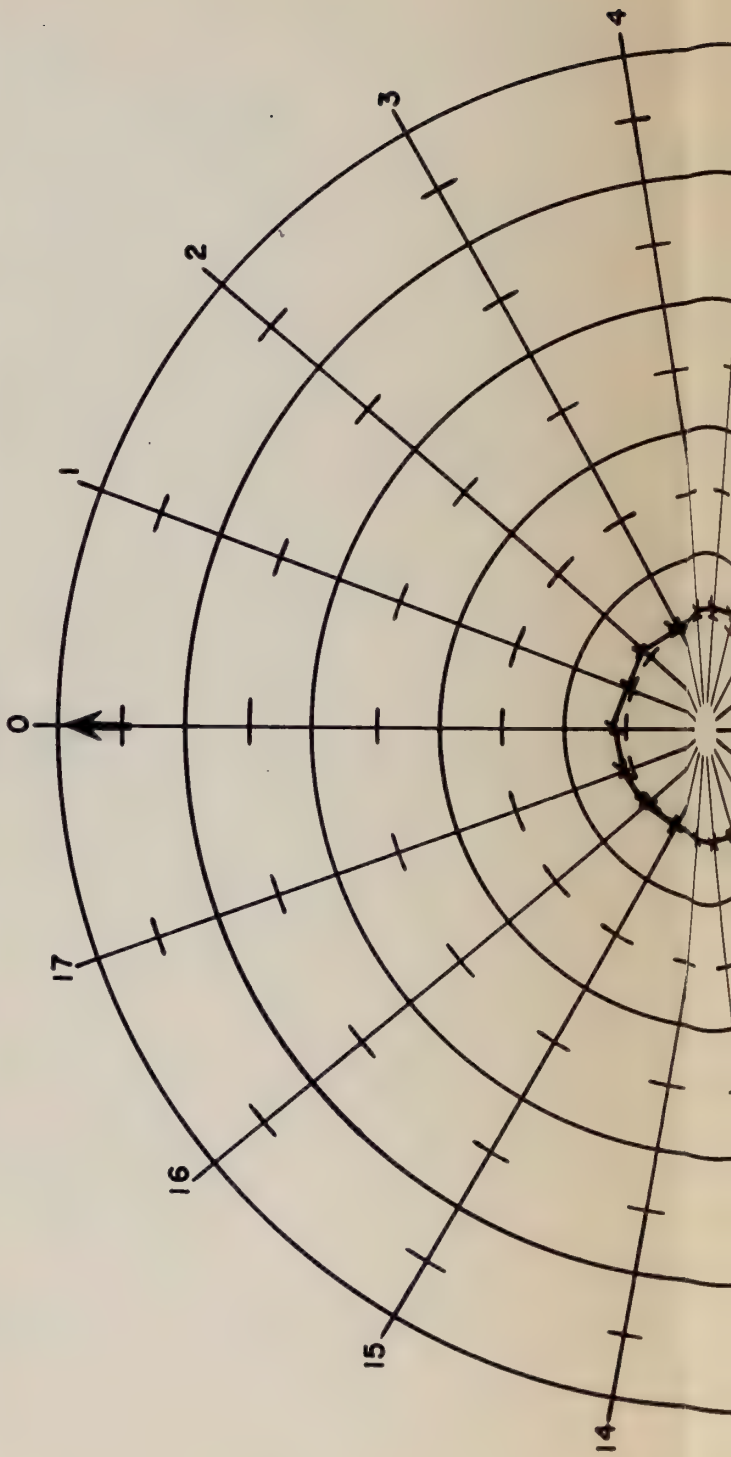


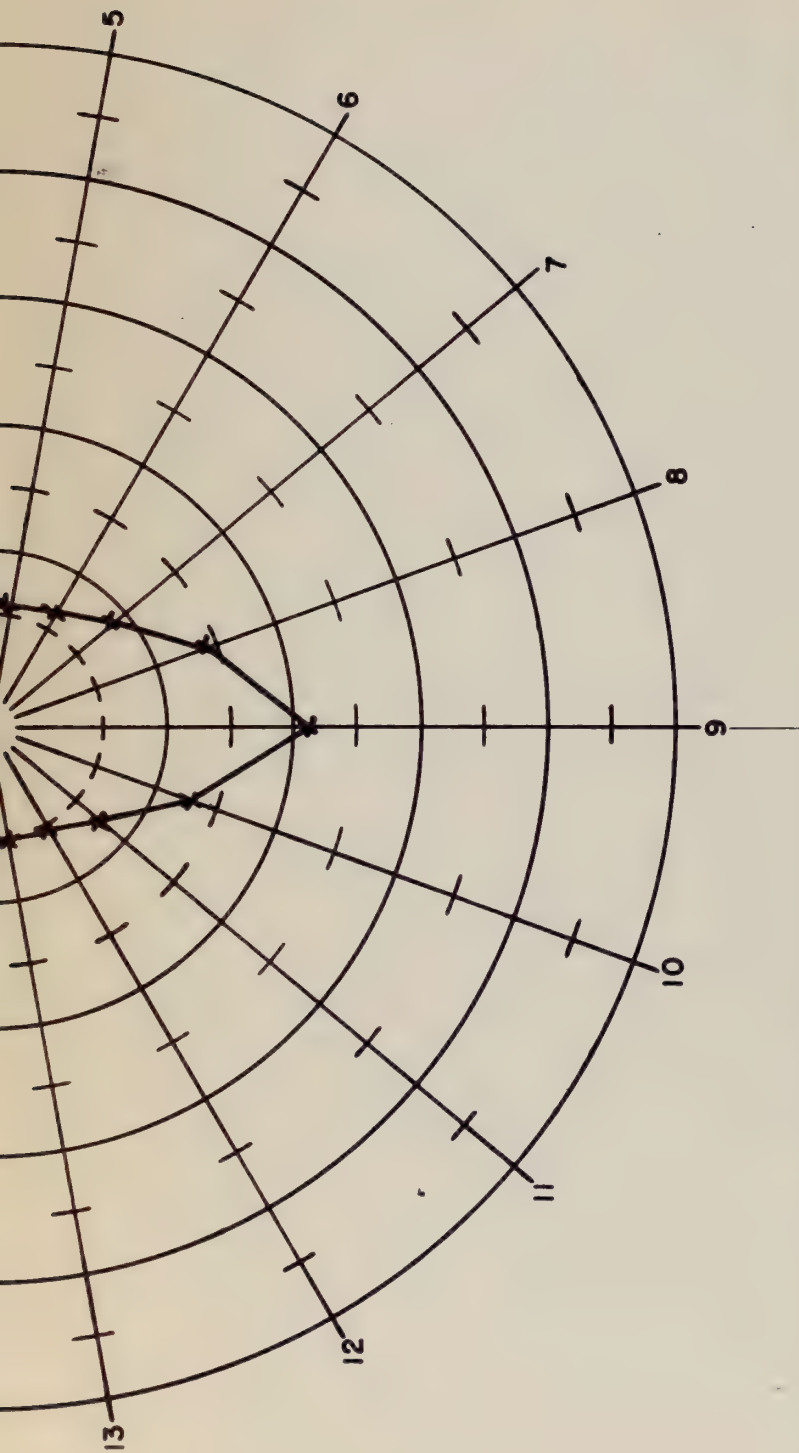




RADIOORIENTATION PLOT POT-B

NO. 1-LONG STRING- 11 SHOTS GUN NO. 1- PERFORATIONS 1482-1492 1 SHOT PER FOOT.
SHOTS





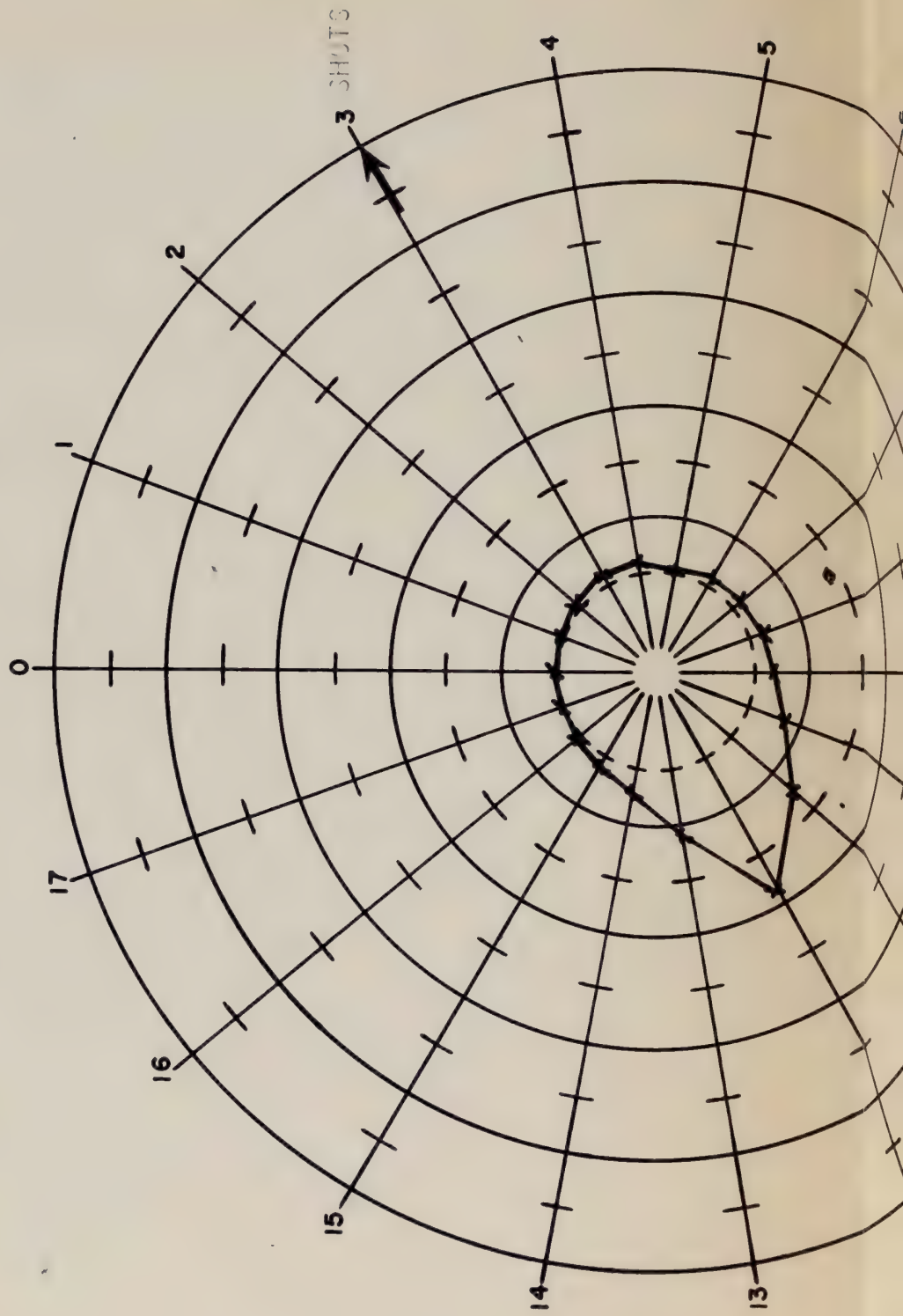
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIOORIENTATION PLOT

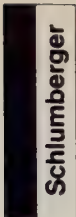
POT-B

NO. 1-LONG STRING- 11 SHOTS GUN NO. 2 PERFORATIONS 1471-1431 1 SHOT PER FOOT



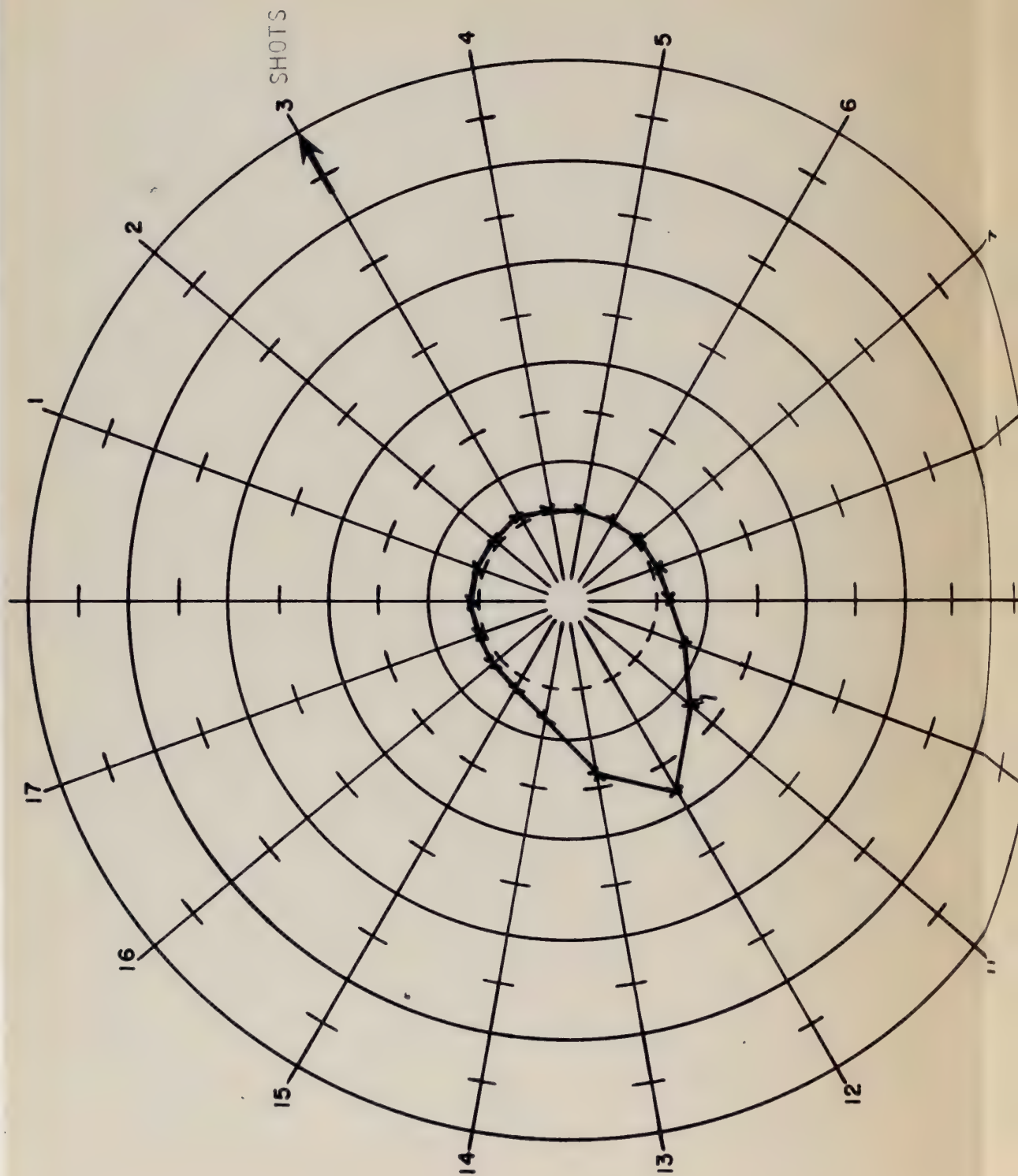


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.



RADIOORIENTATION PLOT

NO. 1-LONG STRING- 11 SHOTS GUN 110.3 PERFORATIONS 1460-1470 1 SHOT PER FOOT
POT-B



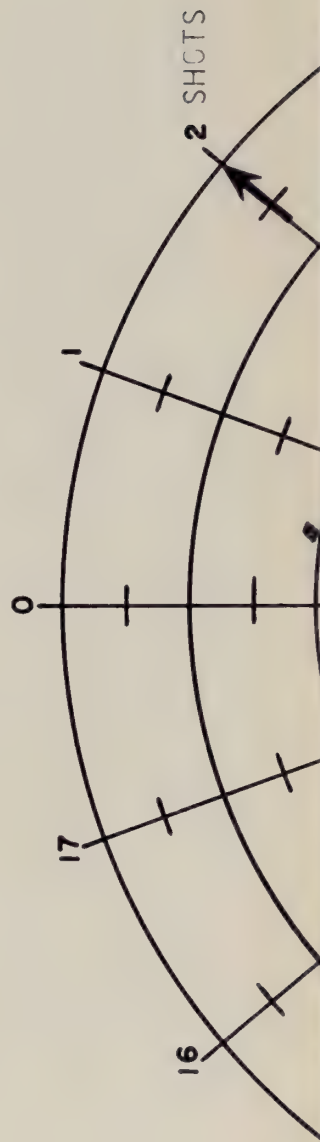
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

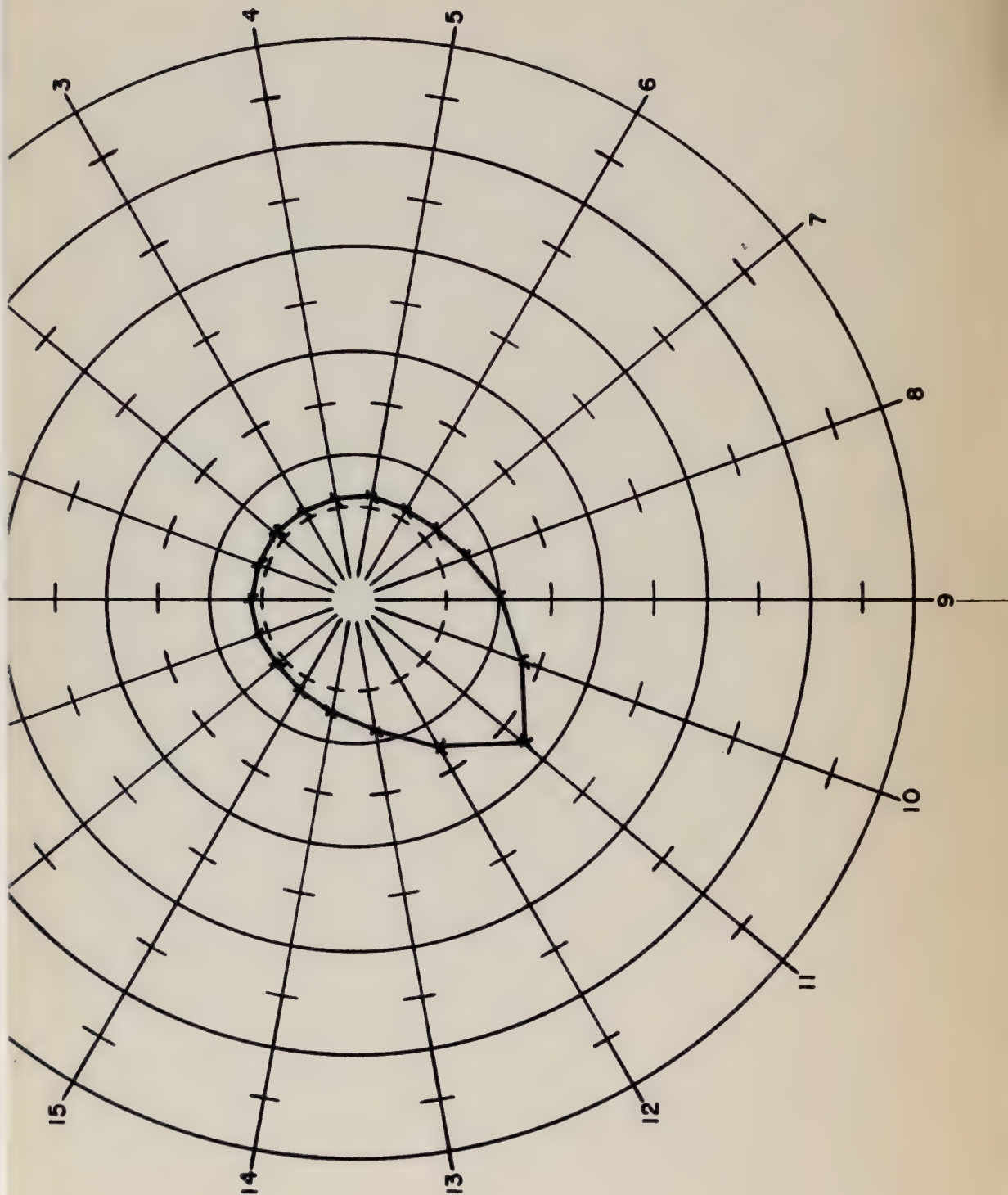
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 1-LONG STRING- 11 SHOTS GUN NO. 4 PERFORATIONS 1449-1459 1 SHOT PER FOOT



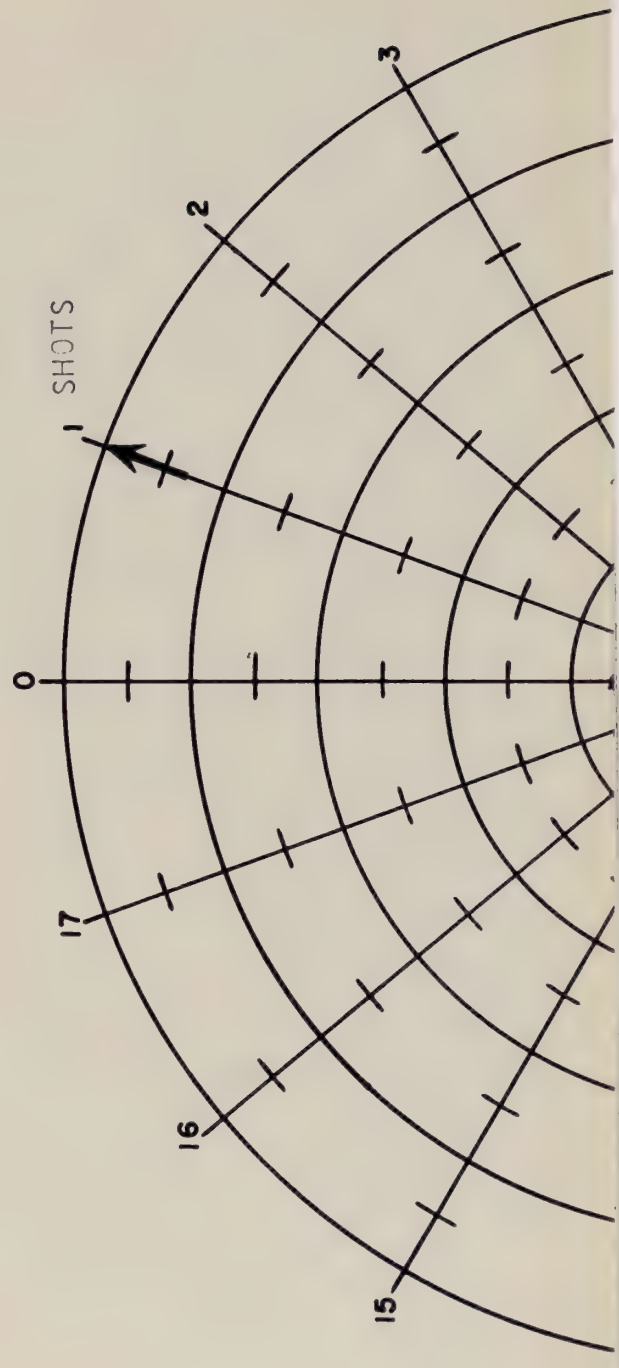


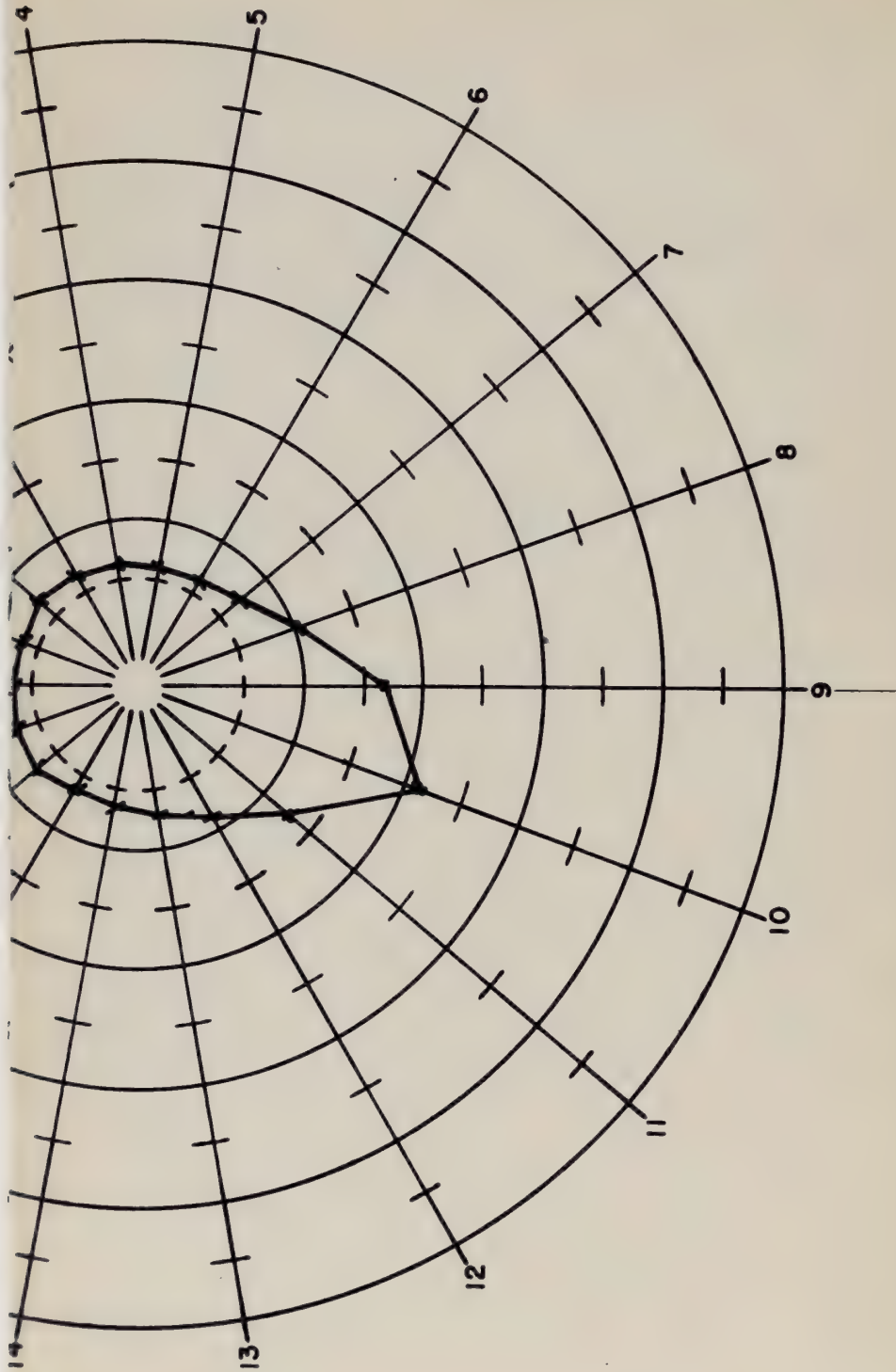
This chart, computation and/or interpretation of our readings from our gamma gamma orientation and detecting instrument is presented to you in accordance with, but subject to the conditions of the contract as set out on pages 1 and 2 of our current price schedule, which are set out on the reverse side of this page. The instrument could be adversely affected by variant metal in the area of the test.

as are set out on pages 1 and 2 of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

NO. 1-LONG STRING- 11 SHOTS GUN NO. 5 PERFORATIONS 1438-1448 ONE SHOT PER FOOT
POT-B





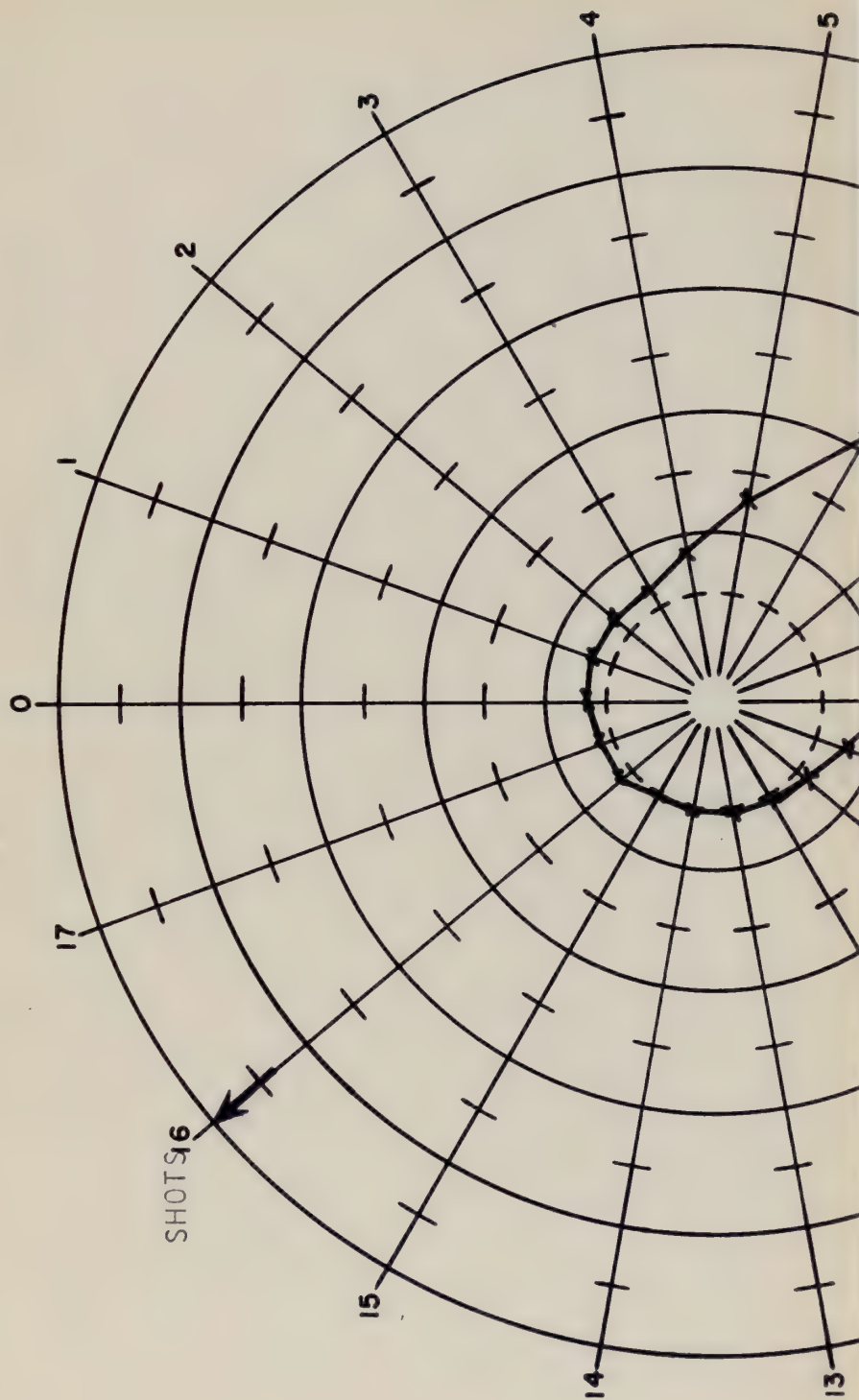
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

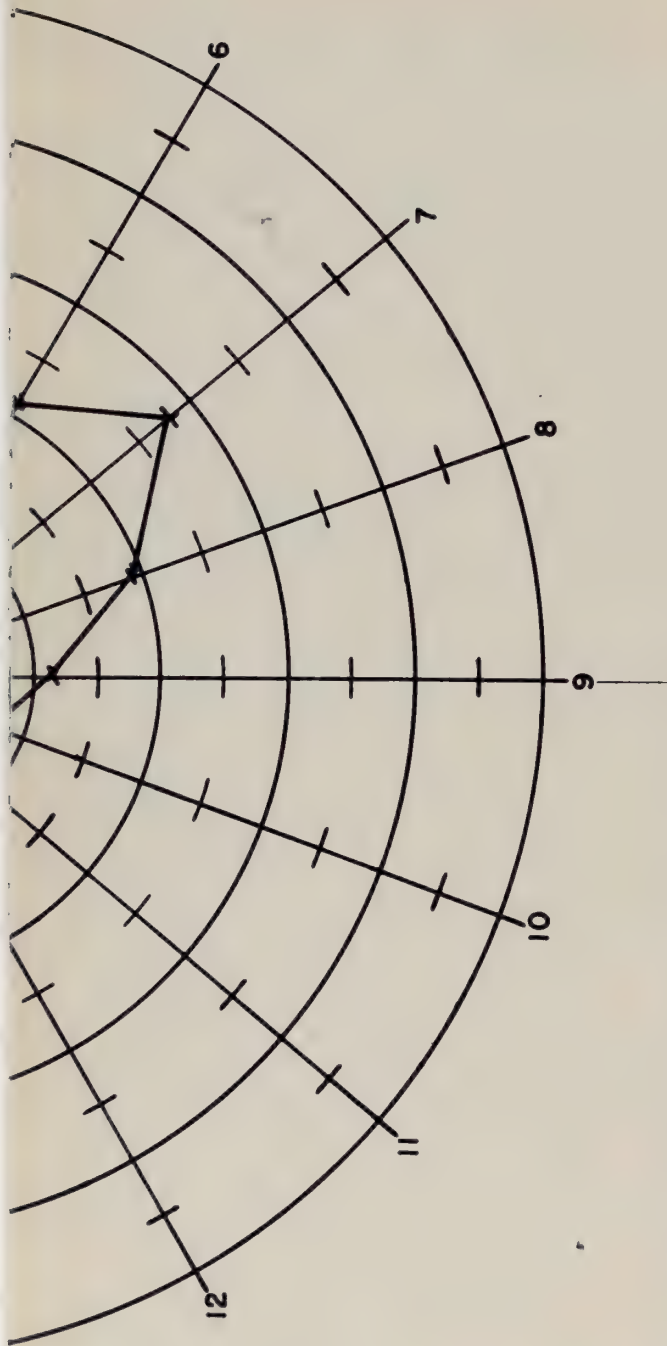
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 1-LONG STRING- 11 SHOTS GUN NO. 6 PERFORATIONS 1427-1437 ONE SHOT PER FOOT





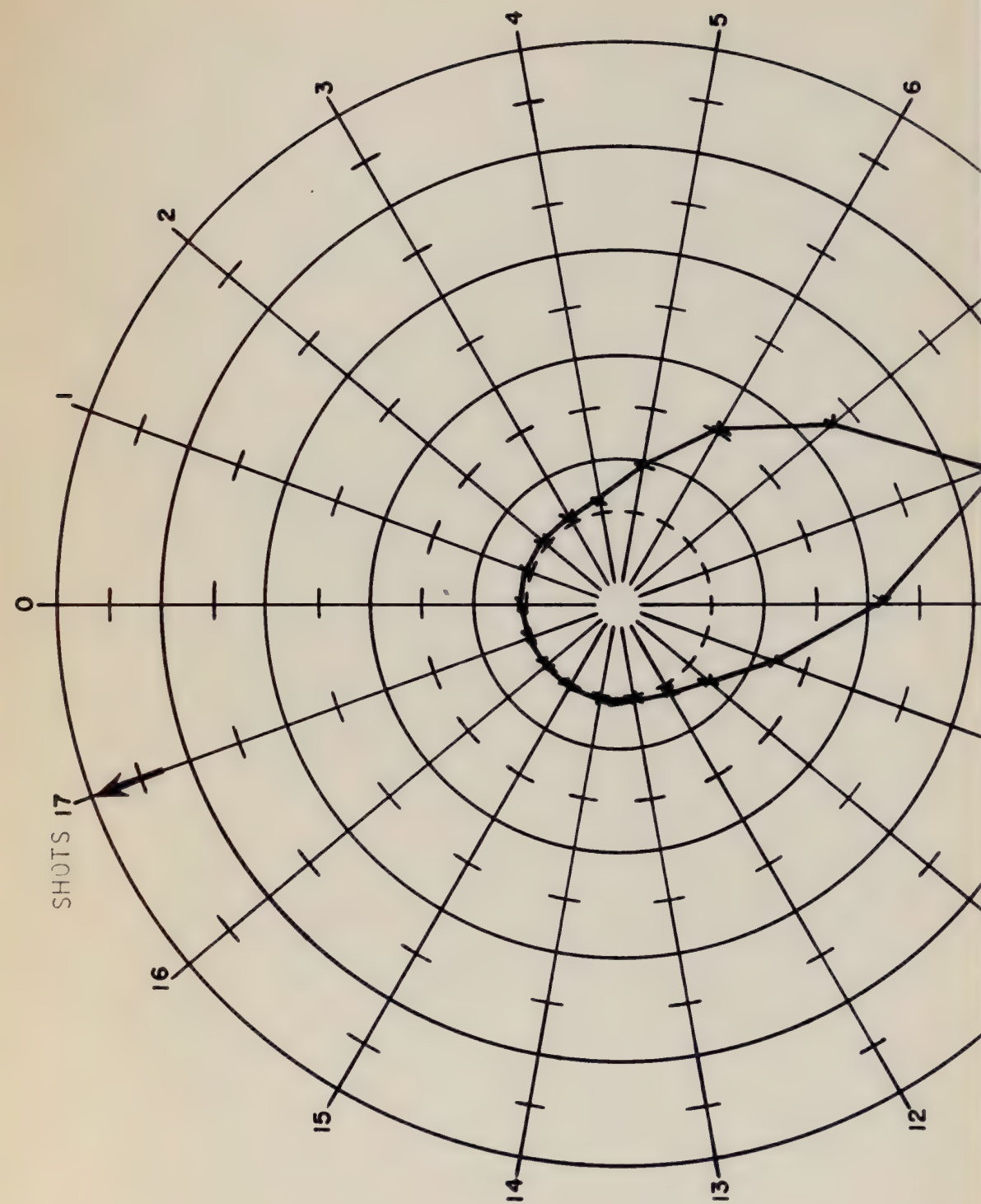
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

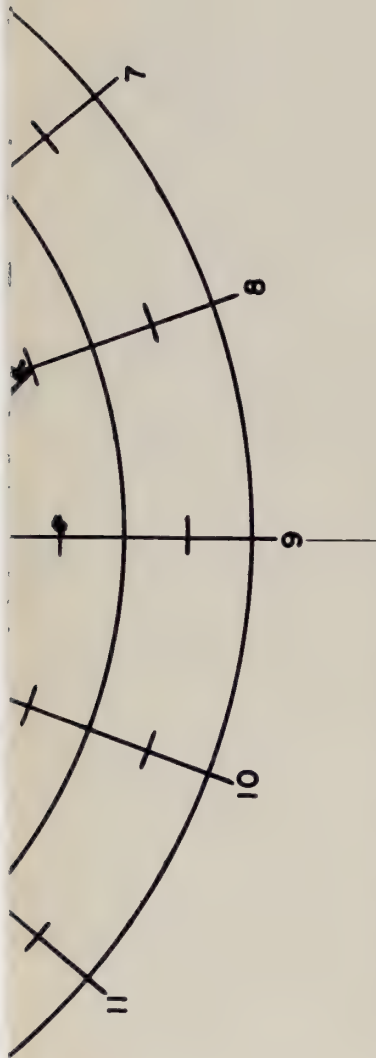
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 1 - LONG STRING - 11 SHOTS GUN NO. 7 PERFORATIONS 1416-1426 ONE SHOT PER FOOT





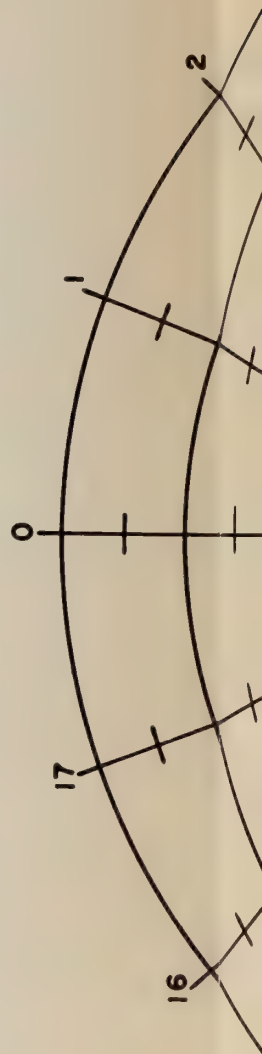
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

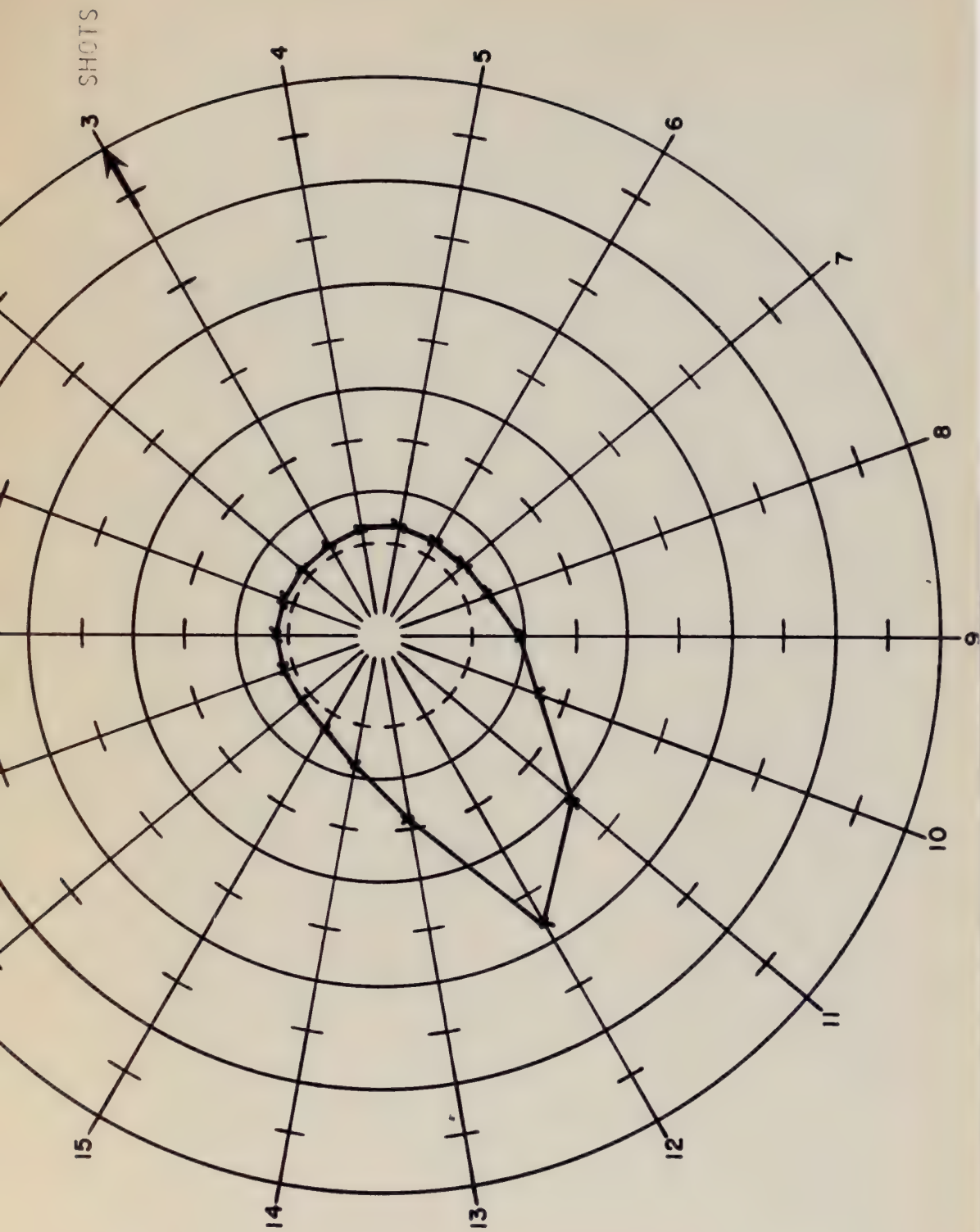
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 1-LONG STRING- 11 SHOTS GUN NO.8 PERFORATIONS 1405-1415 ONE SHOT PER FOOT





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

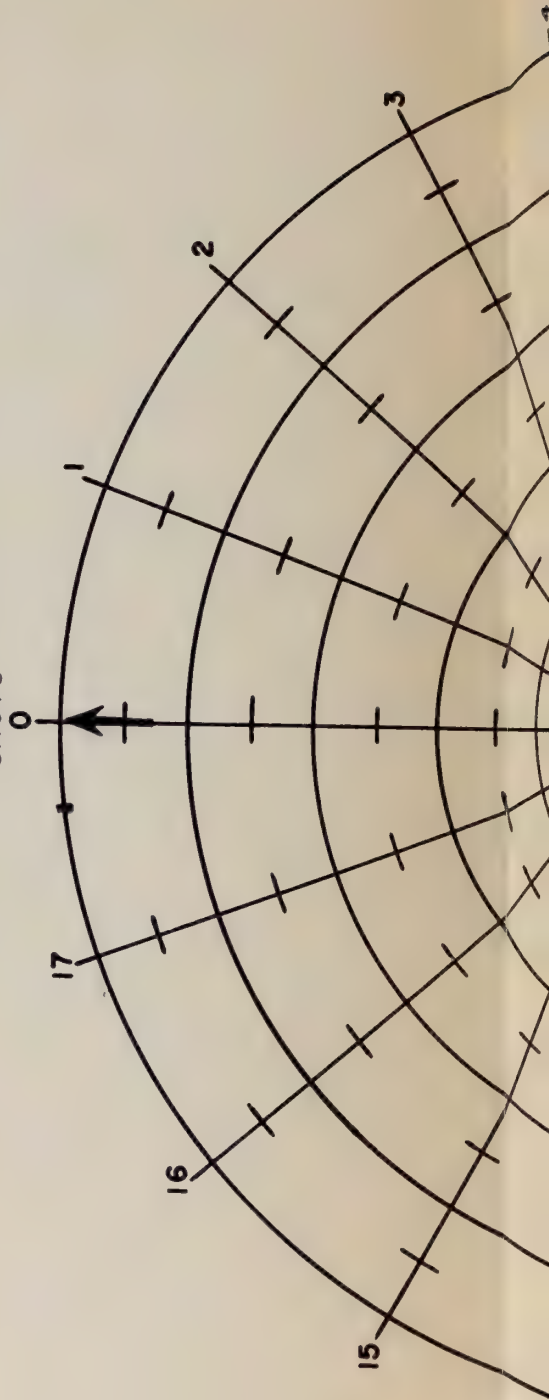
Schlumberger

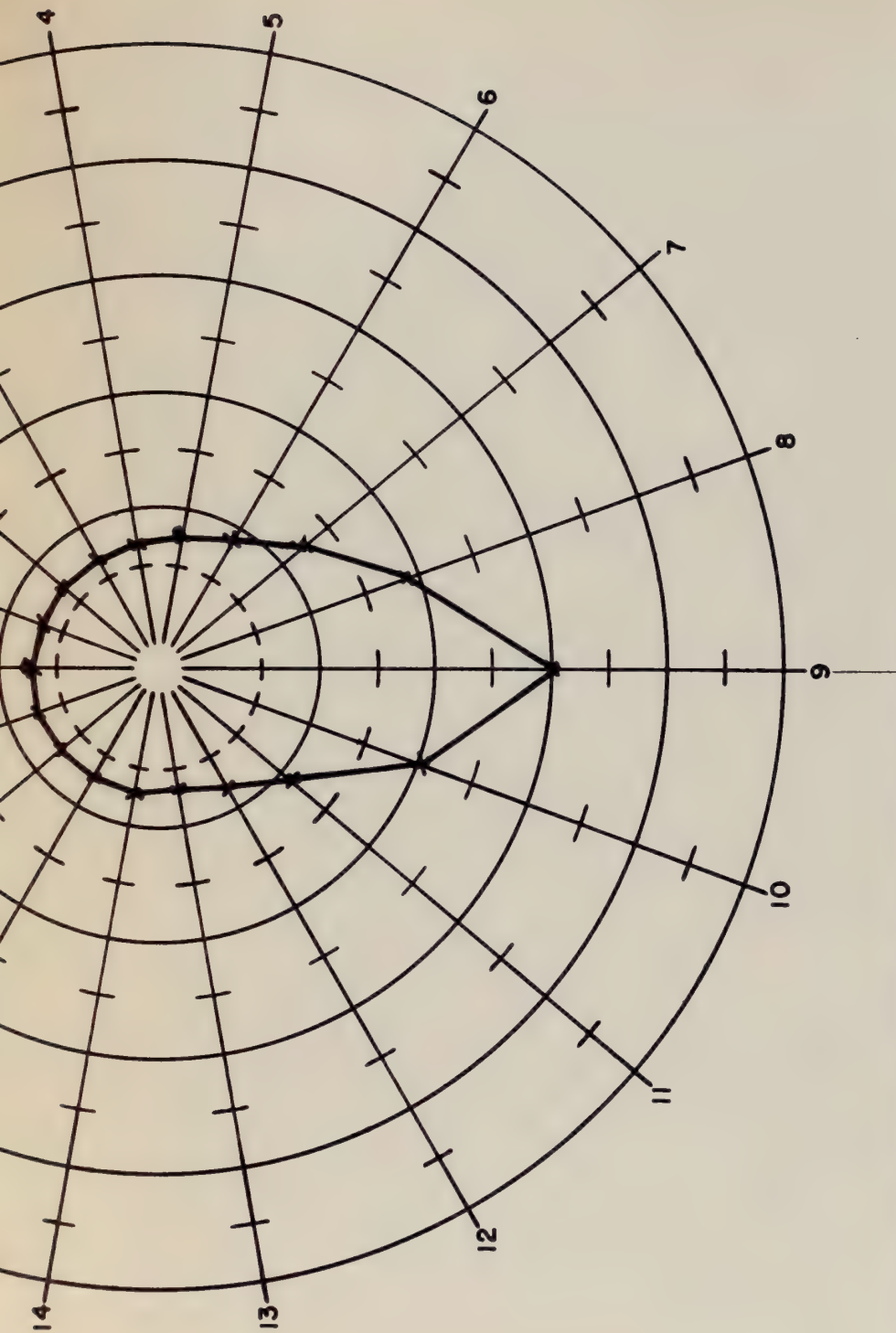
RADIOORIENTATION PLOT

POT-B

NO. 1-LONG STRING- 11 SHOTS GUN NO. 9 PERFORATIONS 1394-1404 ONE SHOT PER FOOT

SHOTS





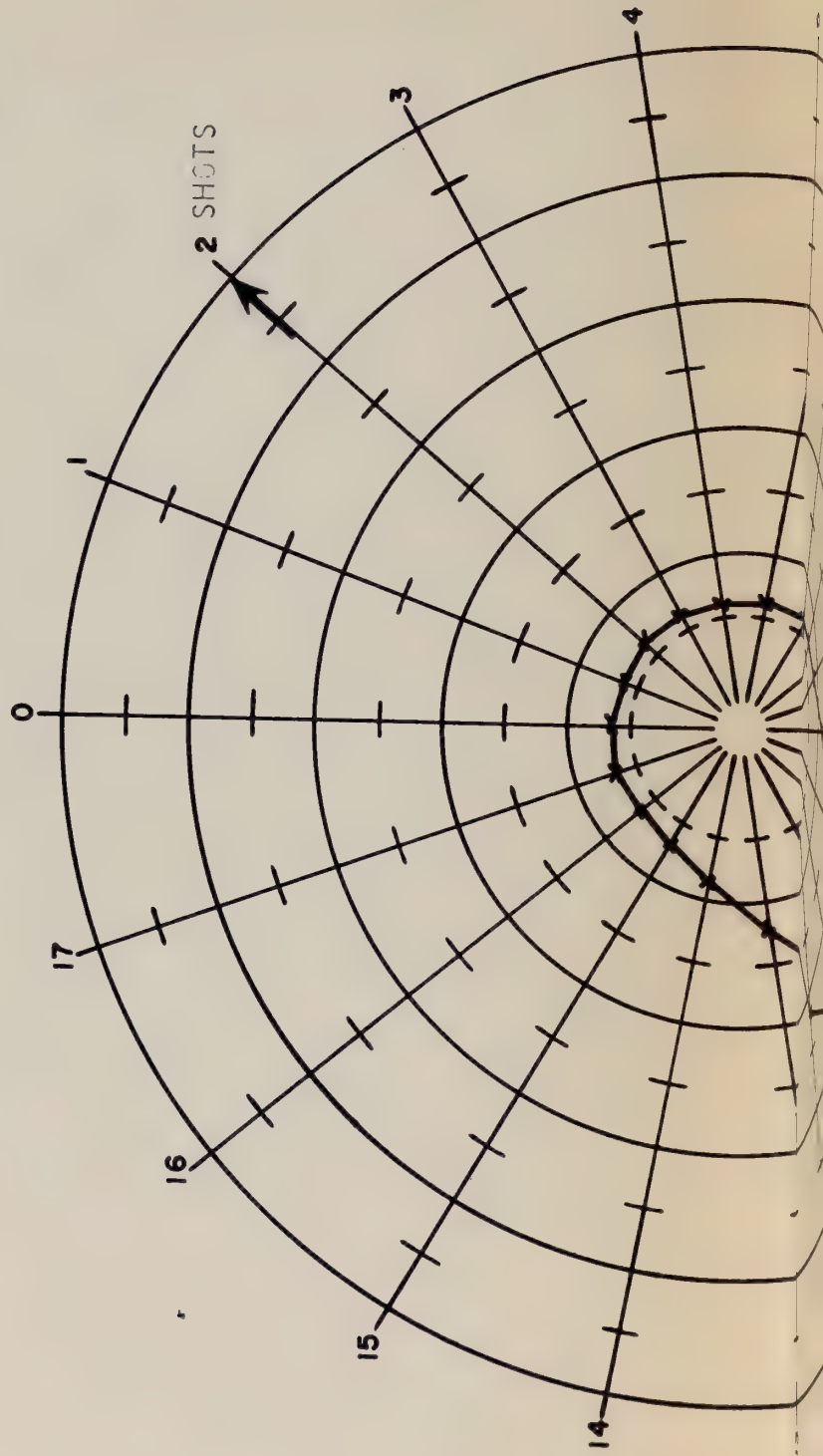
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

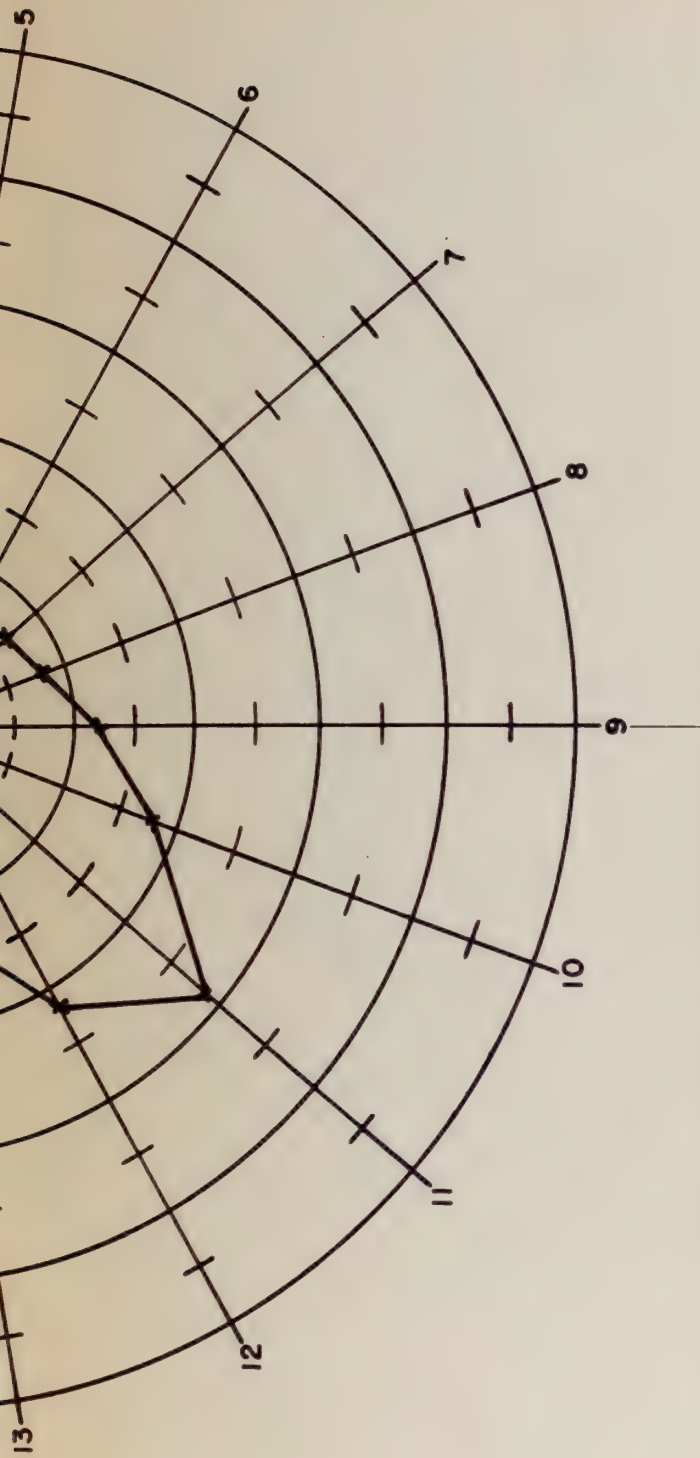
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 1-LONG STRING- 11 SHOTS GUN NO.10 PERFORATIONS 1383-1393 ONE SHOT PER FOOT





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

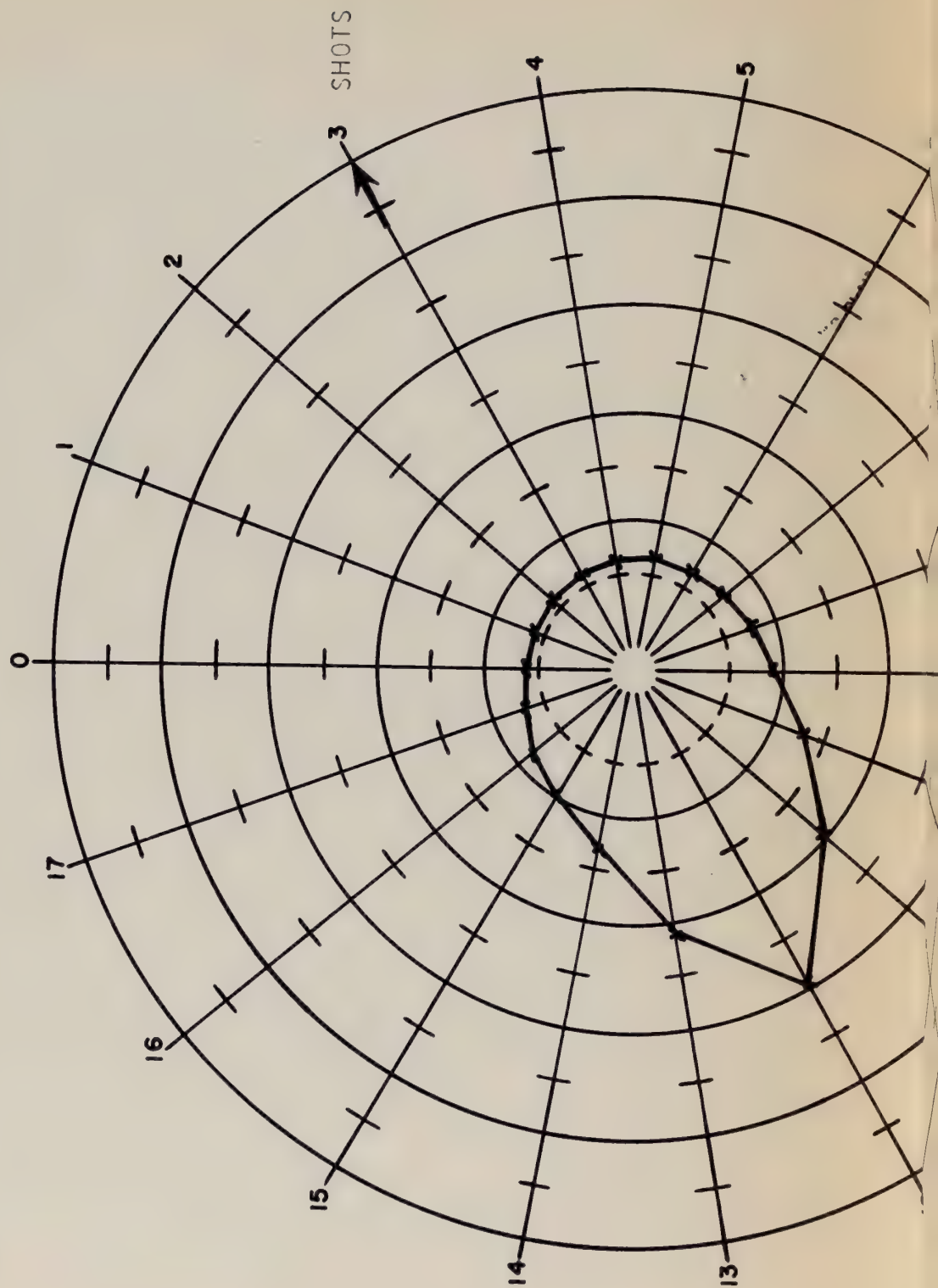
Schlumberger

RADIODIRECTION PLOT

NAVIGATION I LVI

POT-B

NO. 1-LONG STRING-11 SHOTS GUN NO. 11 PERFORATIONS 1372-1382 ONE SHOT PER FOOT



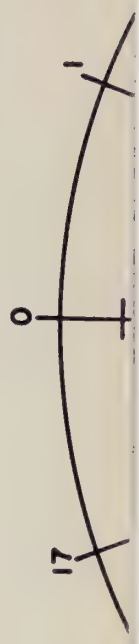


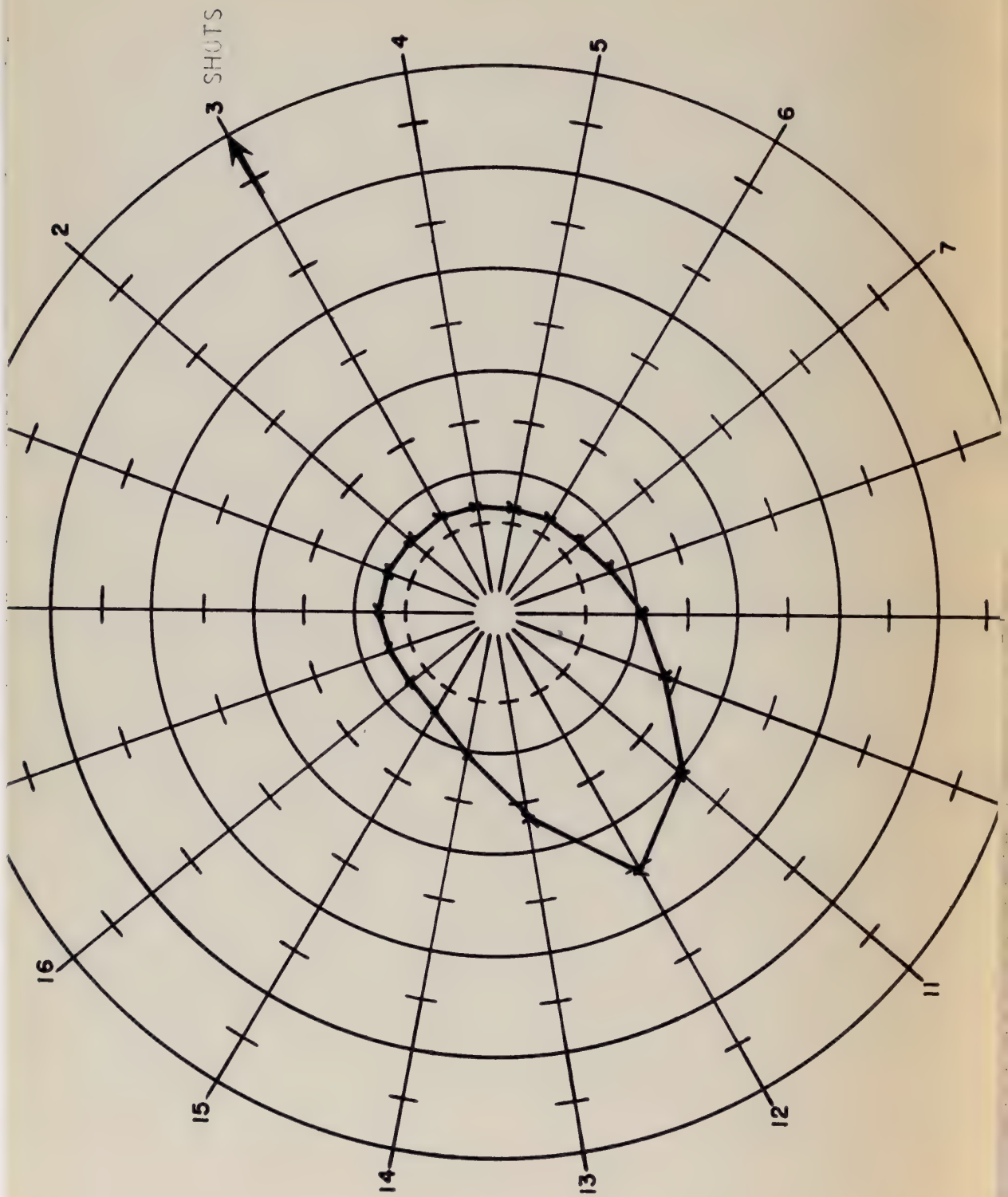
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.



RADIORIENTATION PLOT

NO. 1-LONG STRING-11 SHOTS GUN NO. 12 PERFORATIONS 1361-1371 ONE SHCT PER FOOT
POT-B







This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

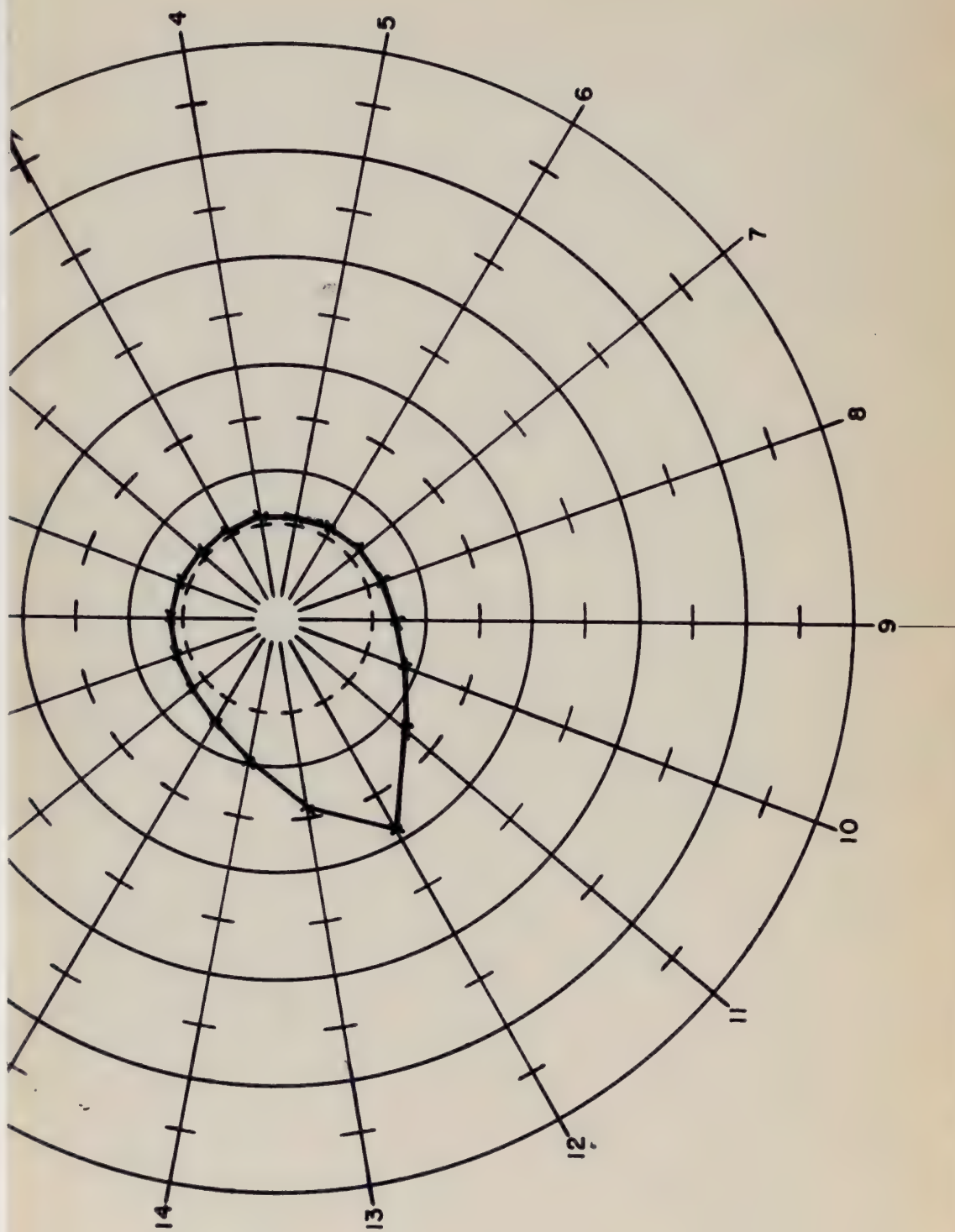
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 1-LONG STRING-11 SHOTS GUN NO. 13 PERFORATIONS 1350-1360 ONE SHOT PER FOOT

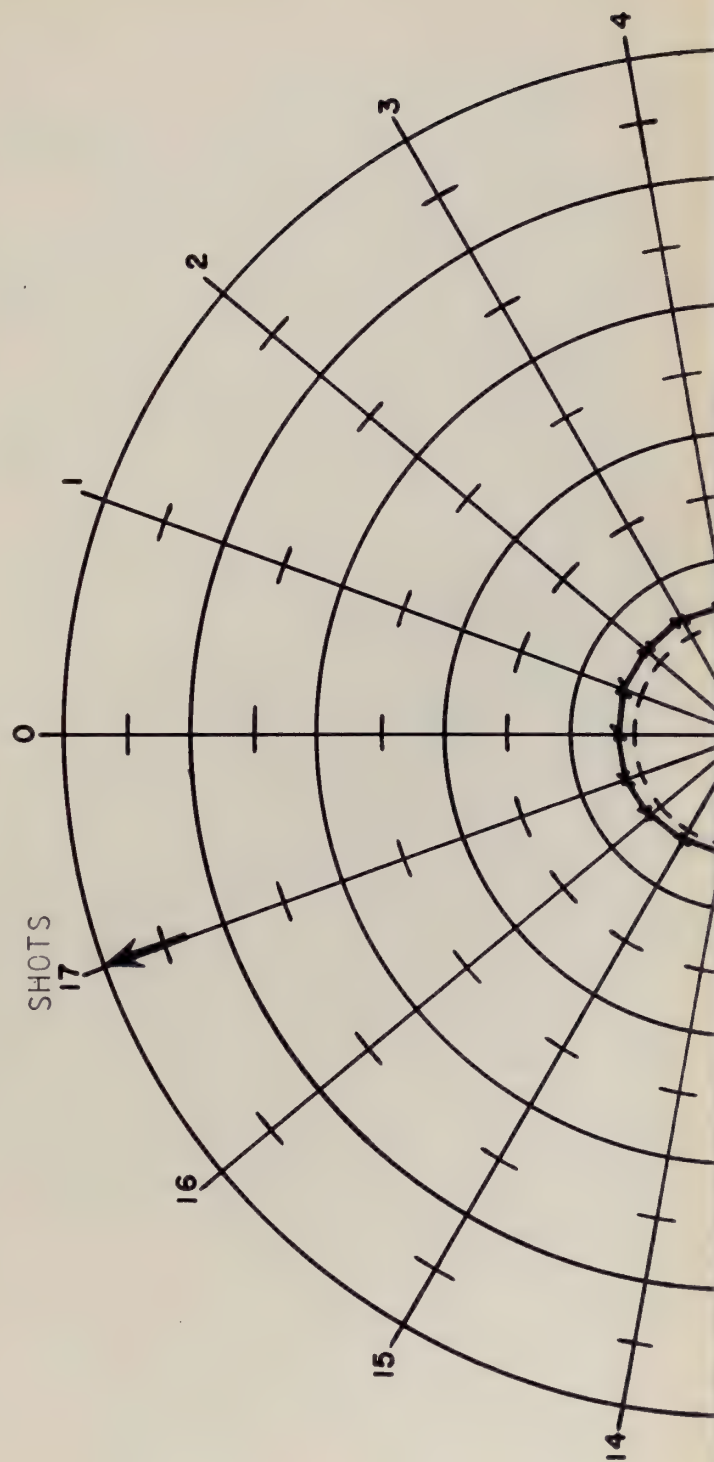


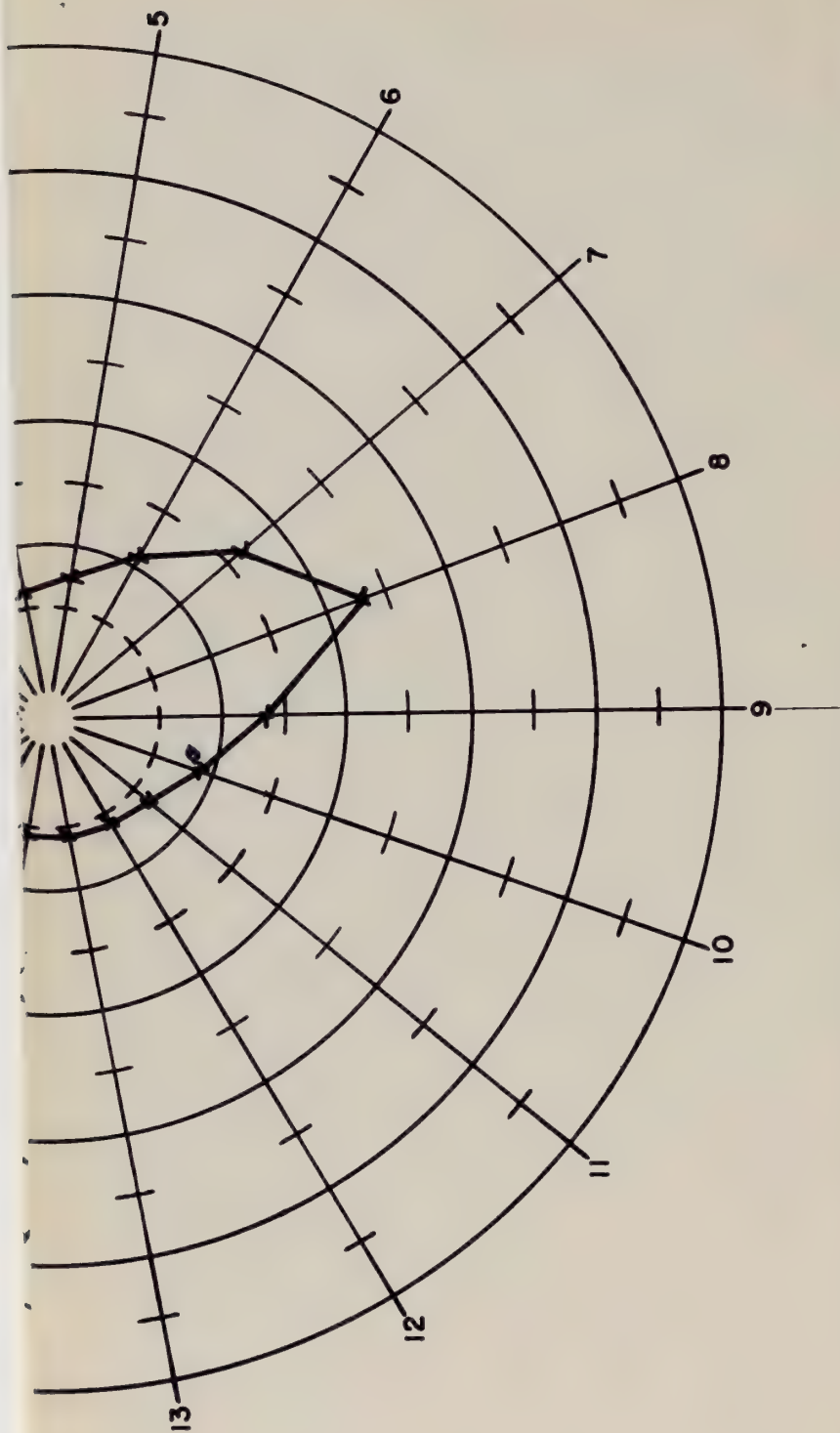


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIO-ORIENTATION PLOT

POT-B
NO. 1-LONG STRING-11 SHOTS GUN NO. 14 PERFORATIONS 1339-1349 ONE SHOT PER FOOT





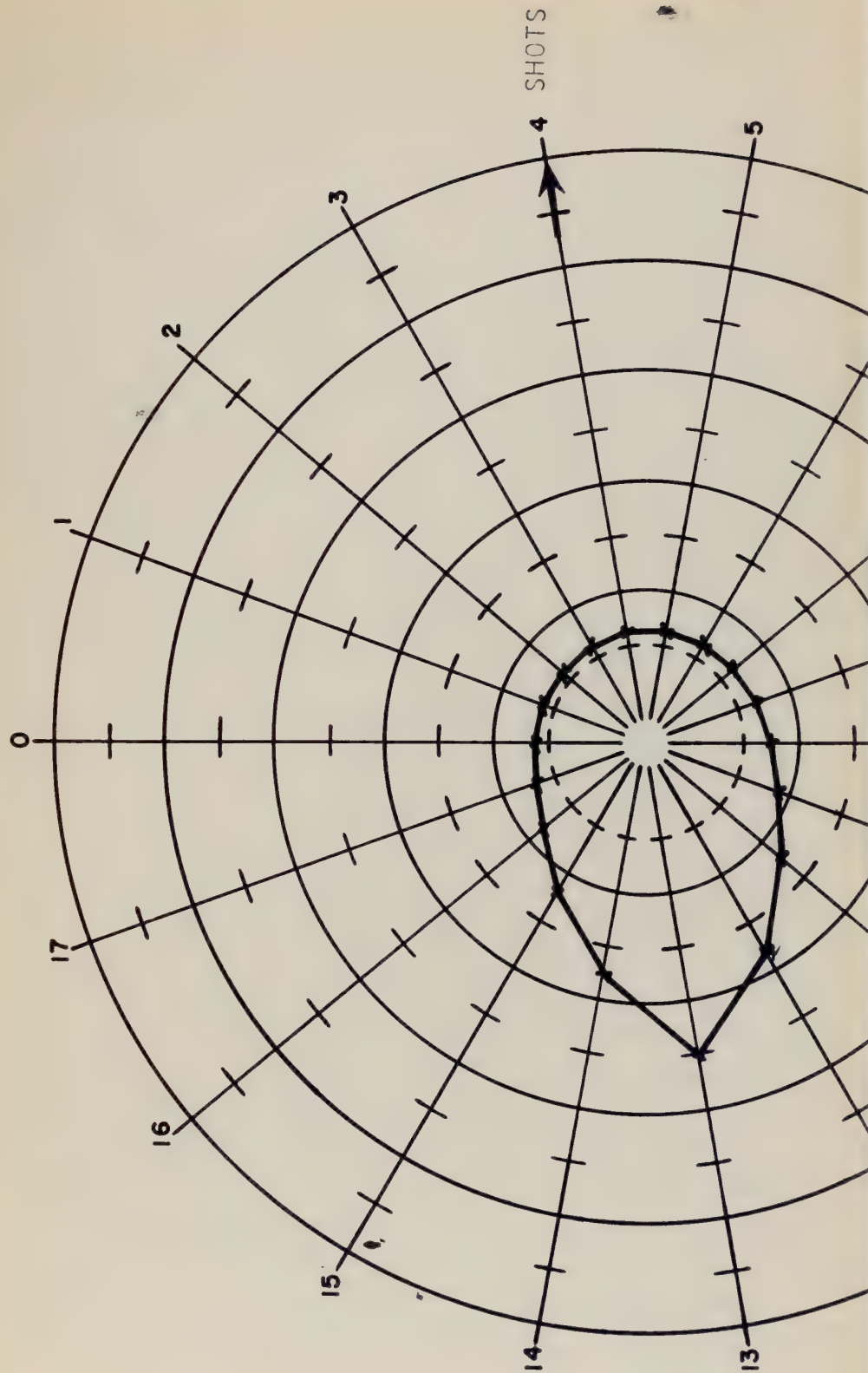
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

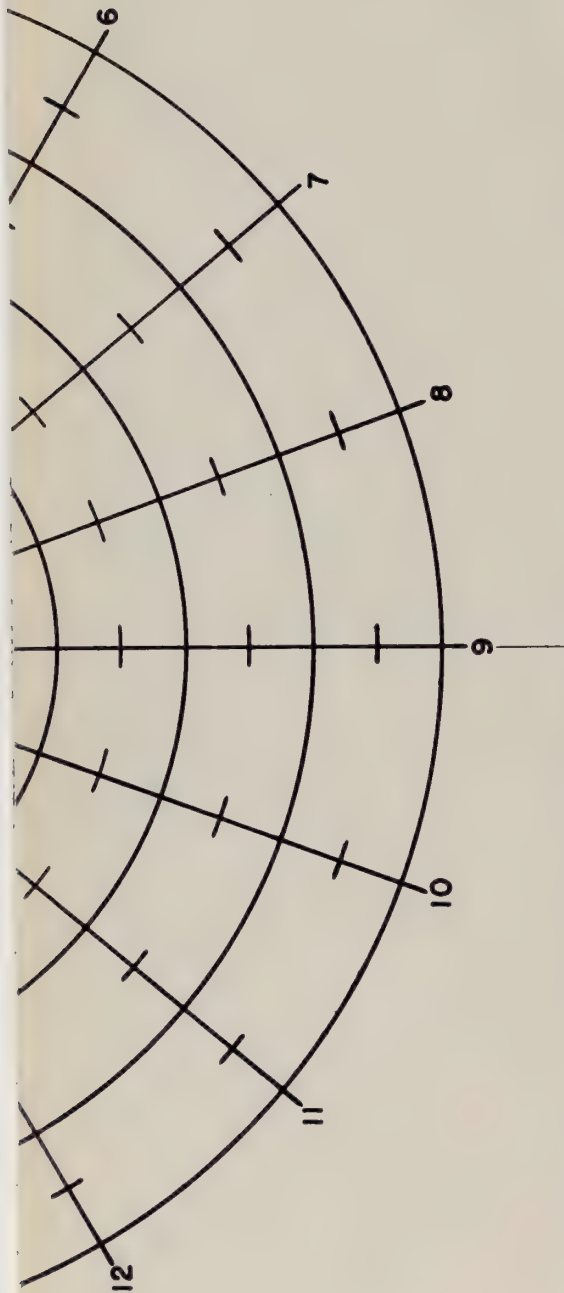
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 1-LONG STRING-11 SHOTS GUN NO. 15 PERFORATIONS 1328-1338 ONE SHOT PER FOOT



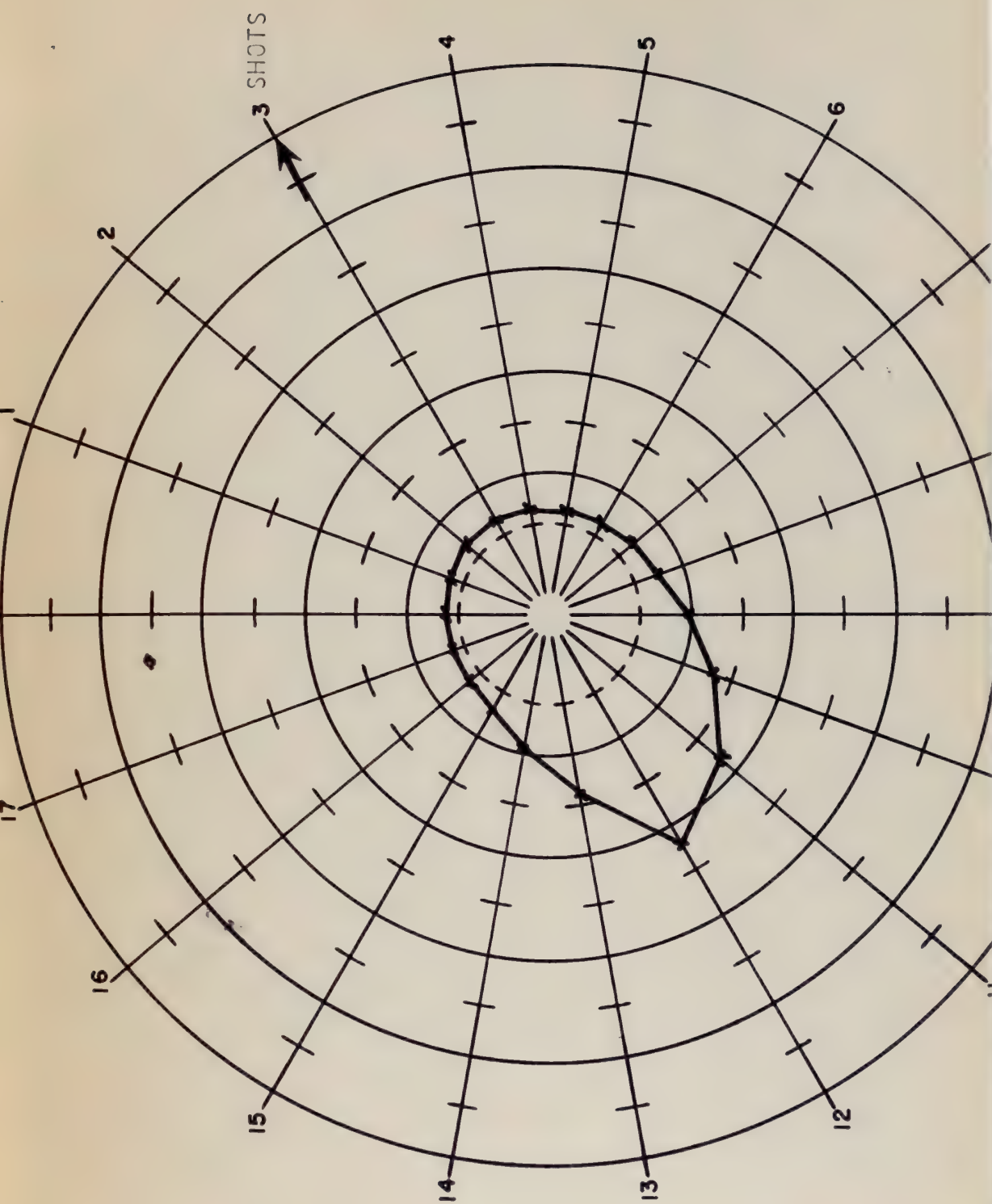


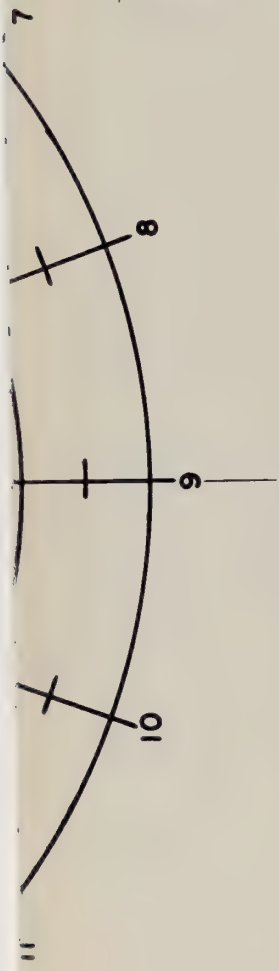
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIOORIENTATION PLOT POT-B

NO.1-LONG STRING-11 SHOTS GUN NO.16 PERFORATIONS 1317-1327 ONE SHOT PER FOOT





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

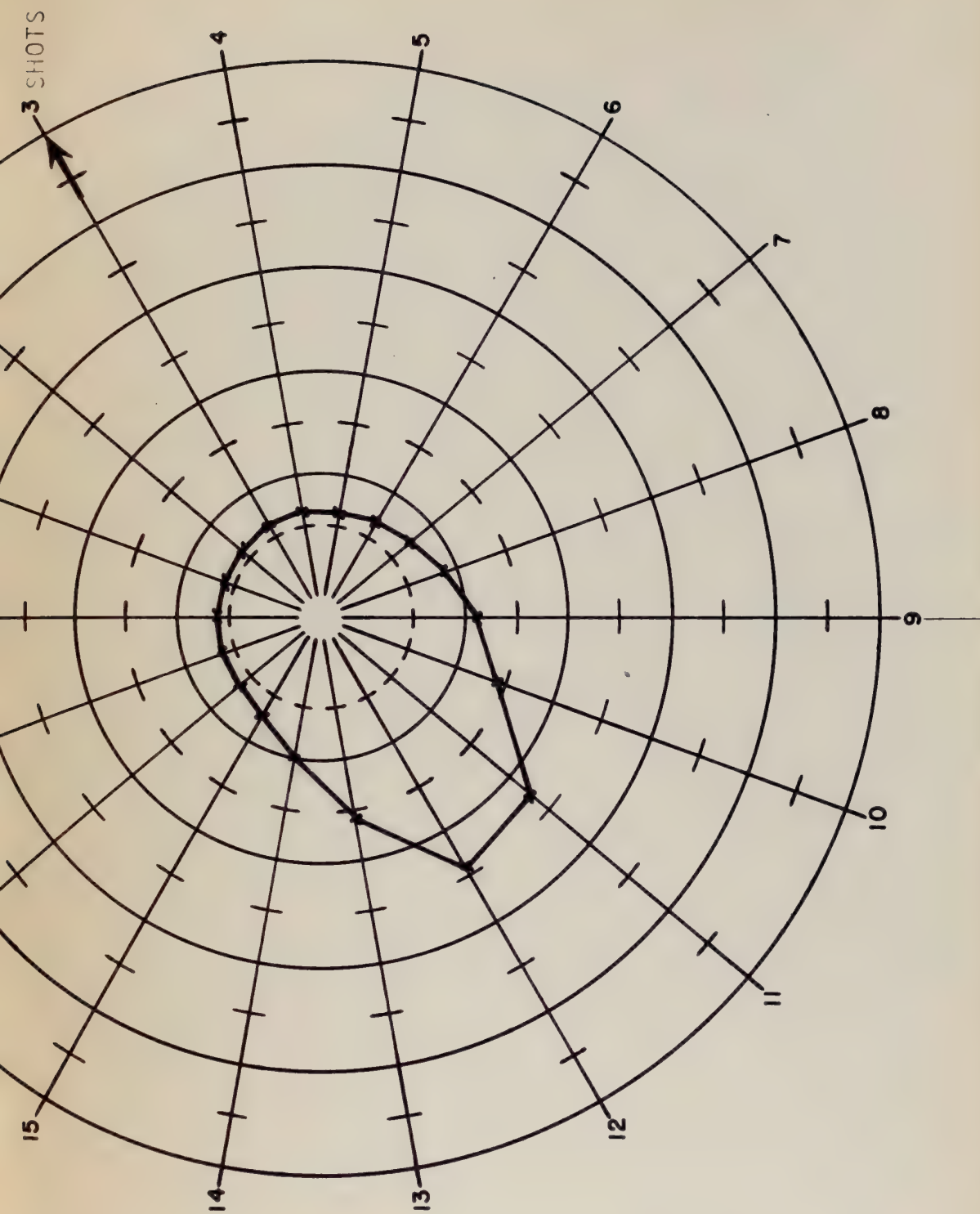
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO.1-LONG STRING-11 SHOTS GUN NO.17 PERFORATIONS 1306-1316 ONE SHOT PER FOOT





This chart summarizes and/or interpretation of our readings from our gamma-gamma orientation and de.

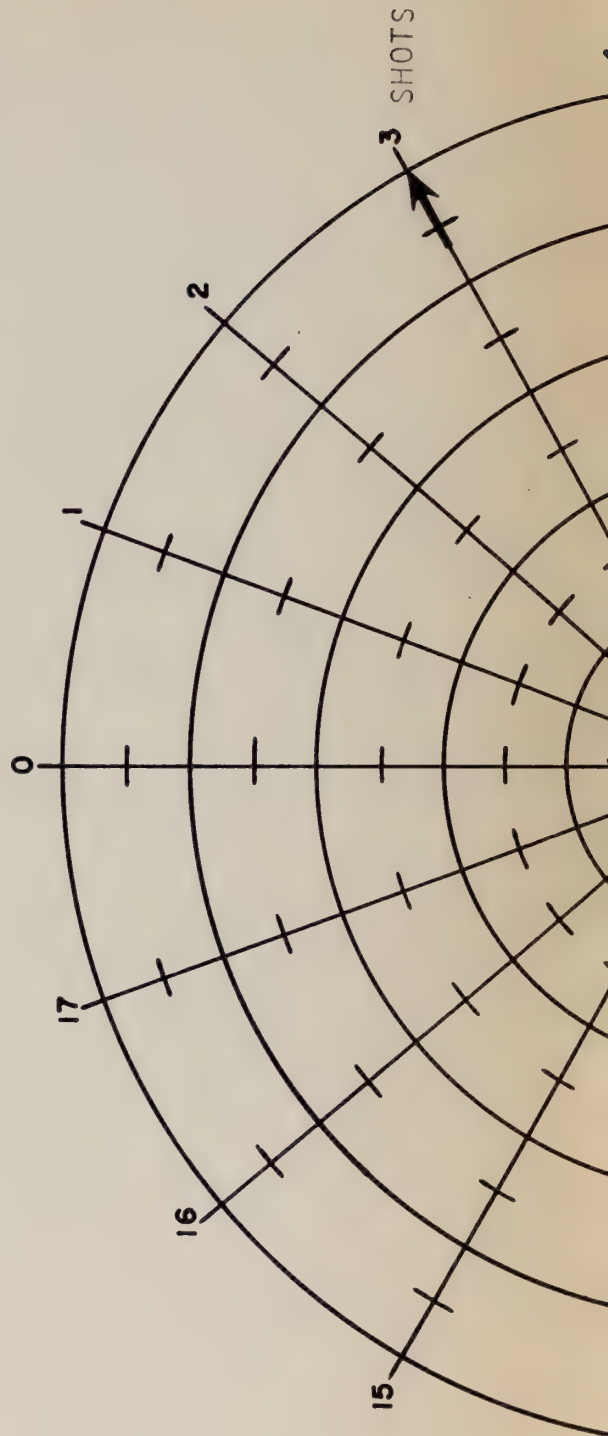
Testing instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

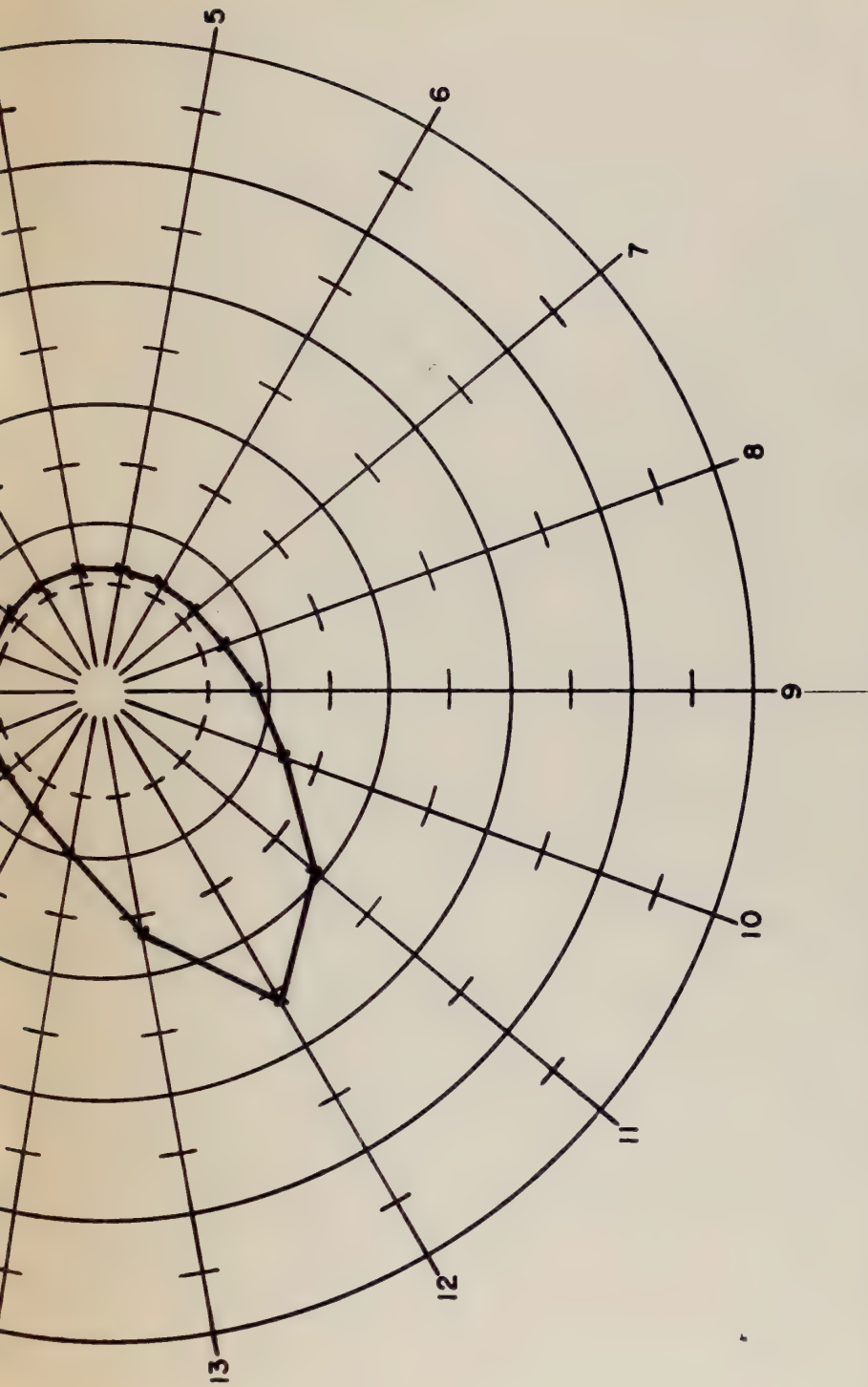
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO.1-LONG STRING-10 SHOTS GUN NO.18 PERFORATIONS 1296-1305 ONE SHOT PER FOOT





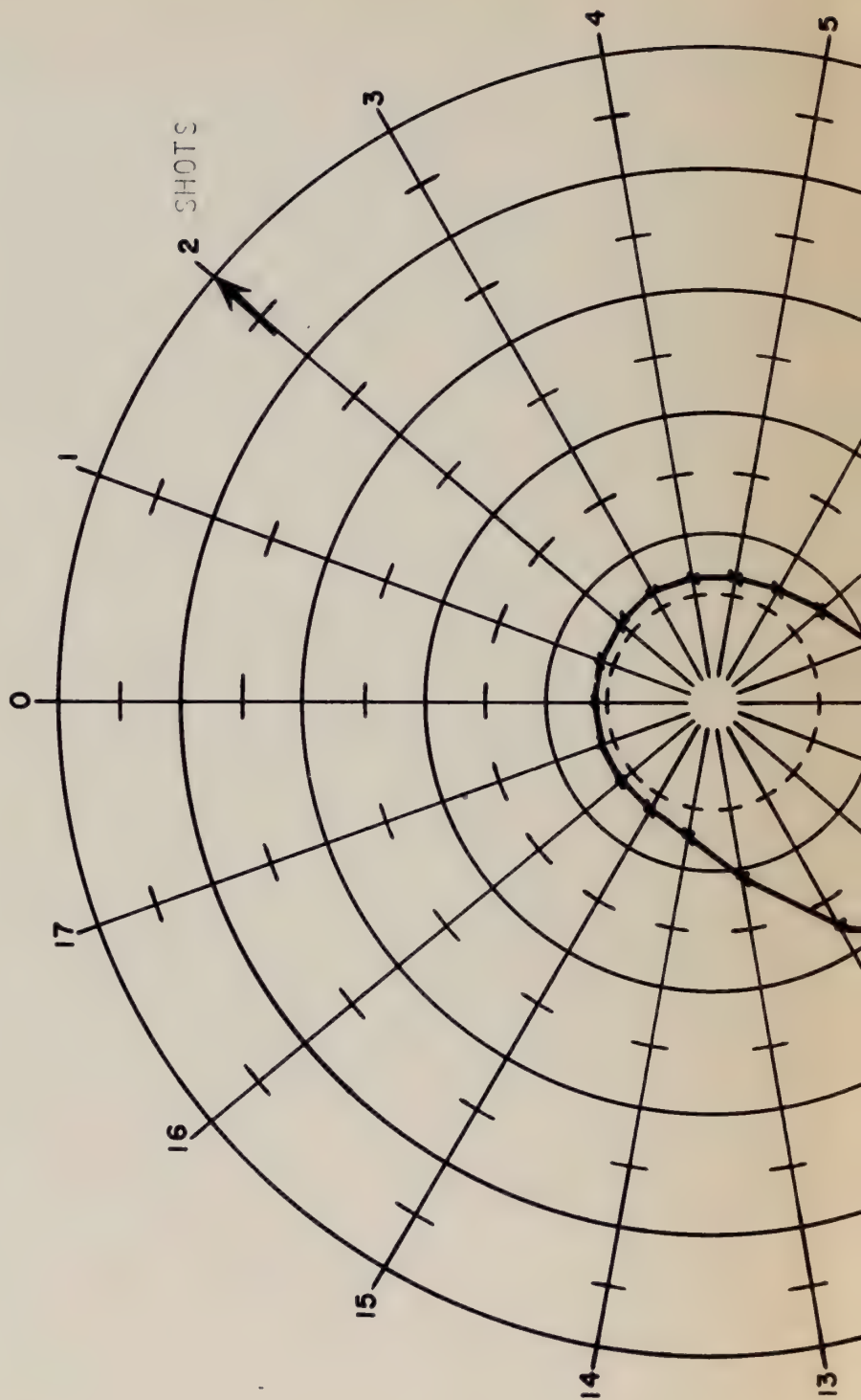
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

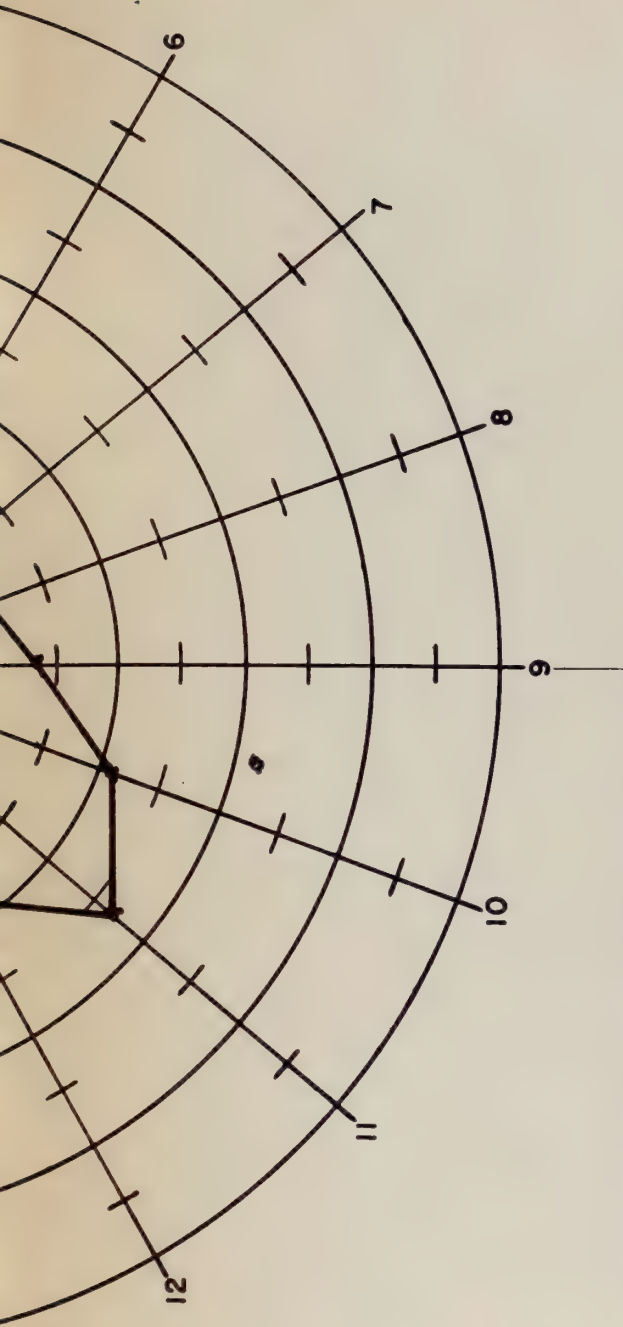
Schlumberger

RADIOORIENTATION PLOT

POT-B

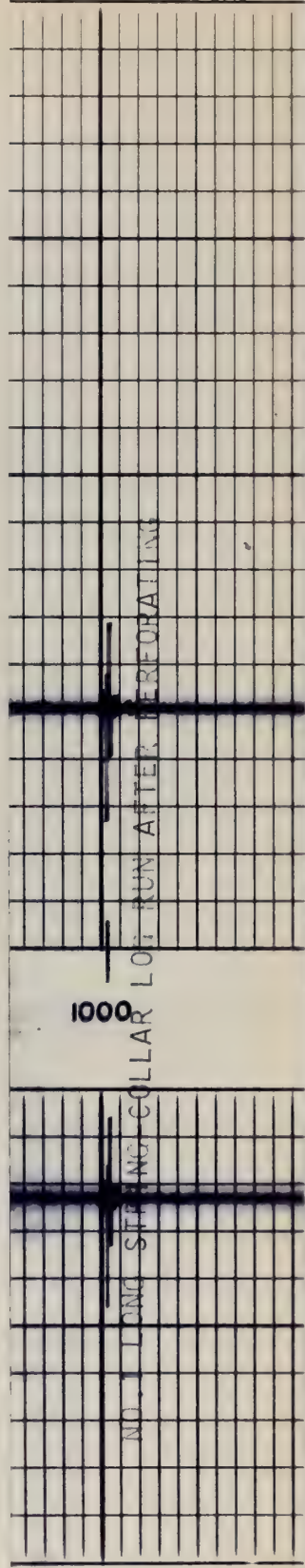
NO.1-LONG STRING-4 SHOTS GUN NO.19 PERFORATIONS 1292-1295 ONE SHOT PER FOOT

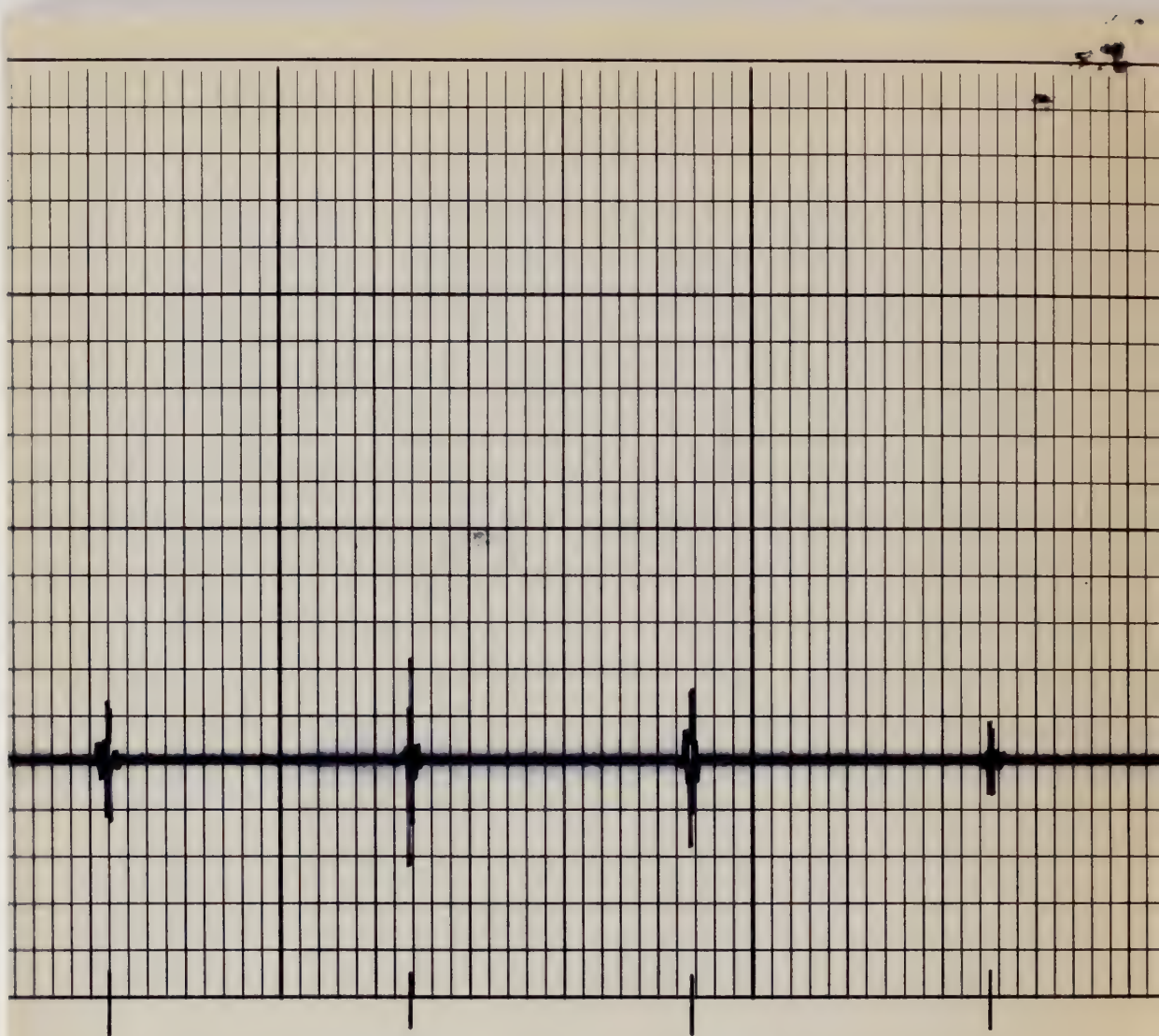




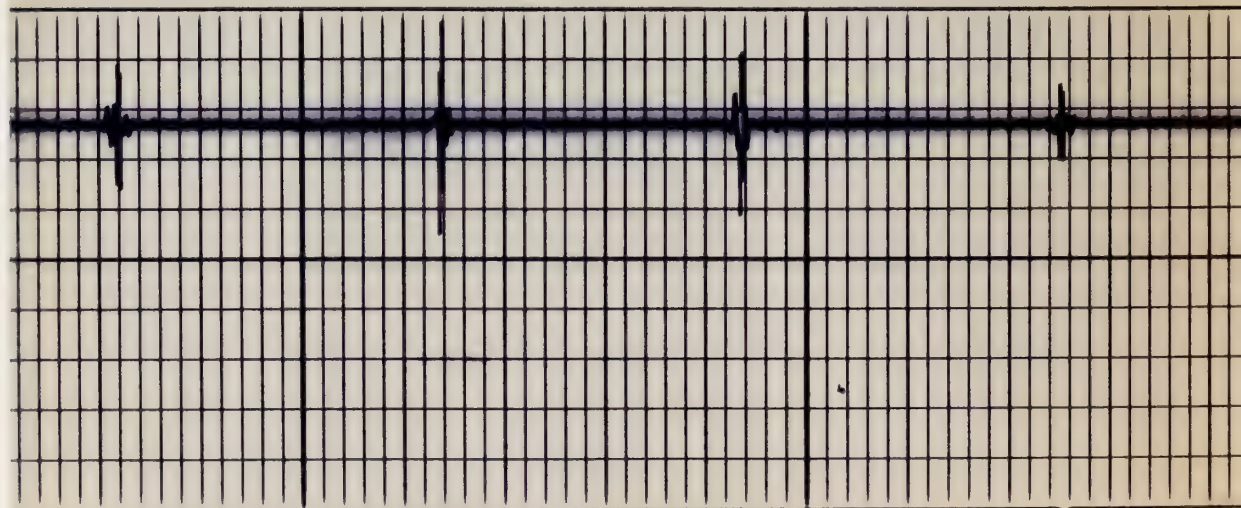
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

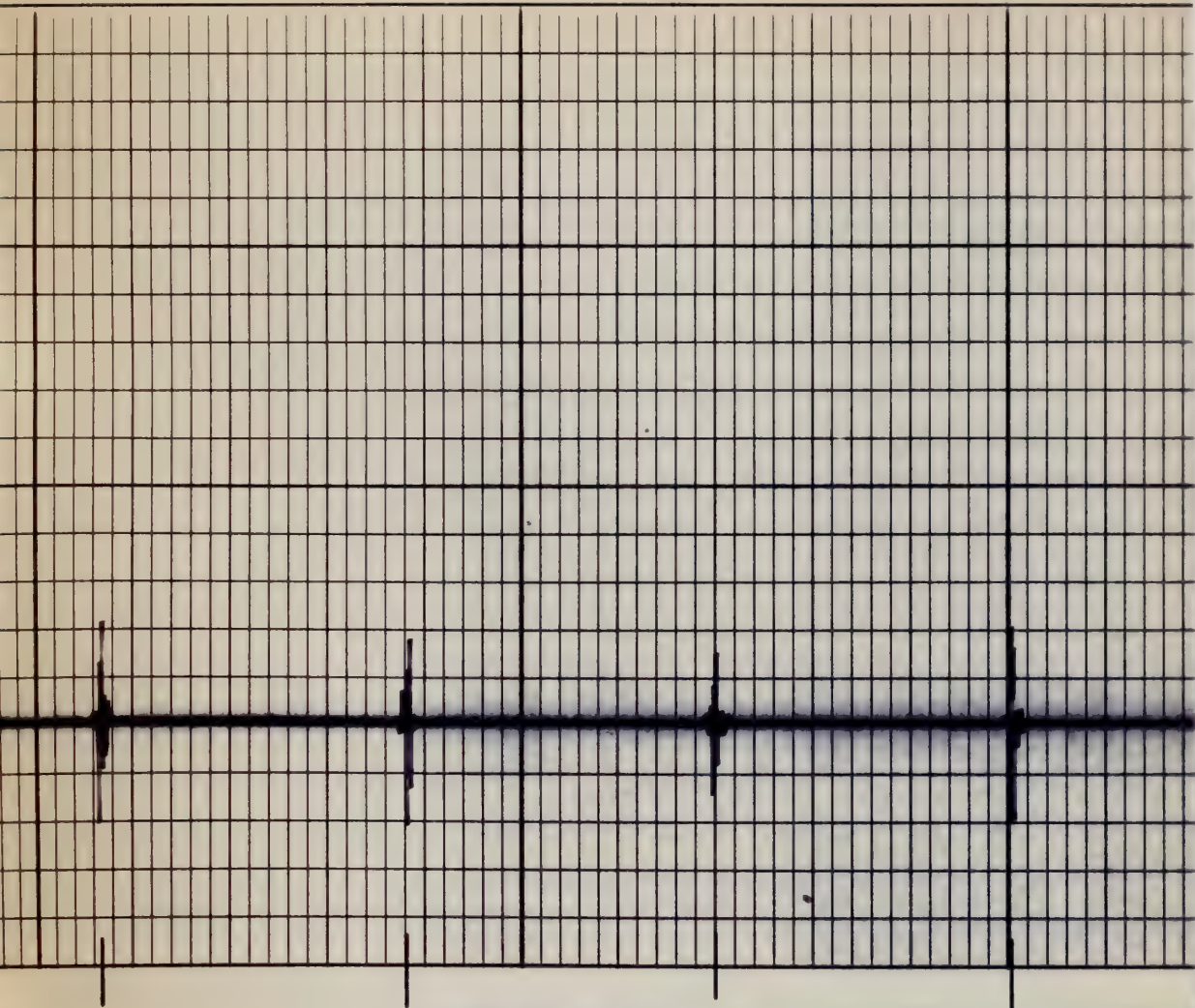
Schlumberger



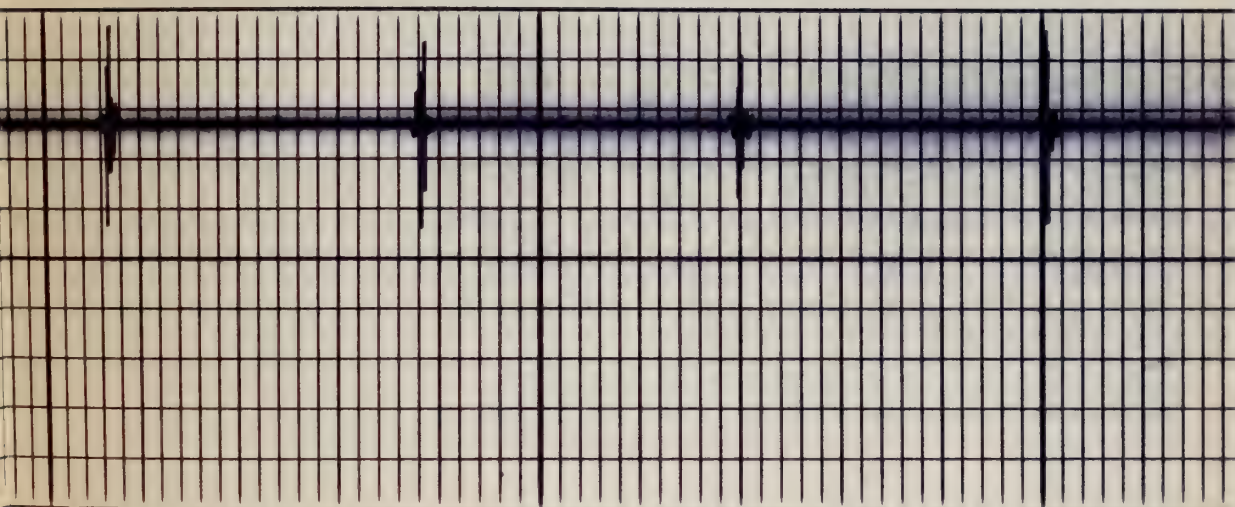


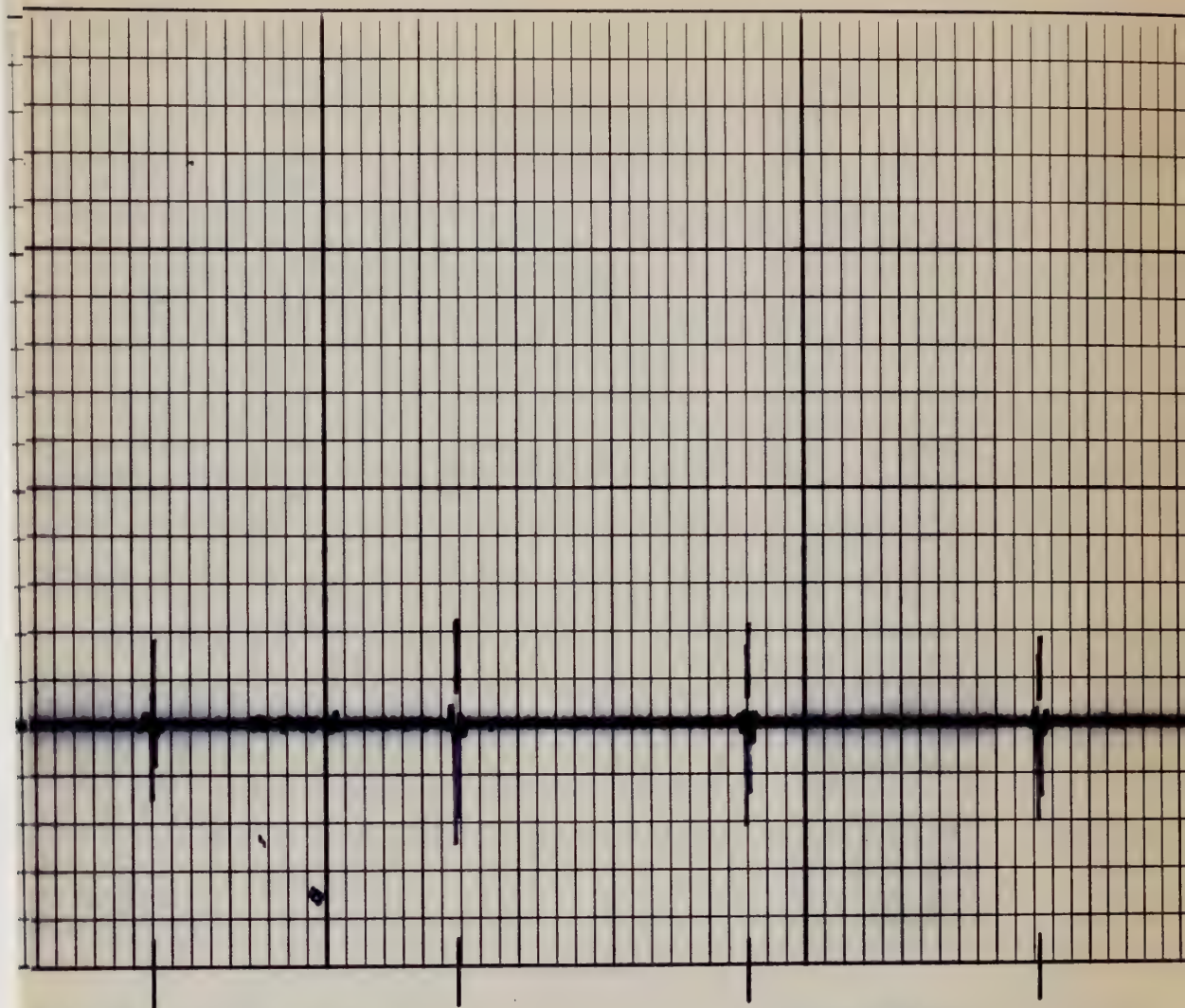
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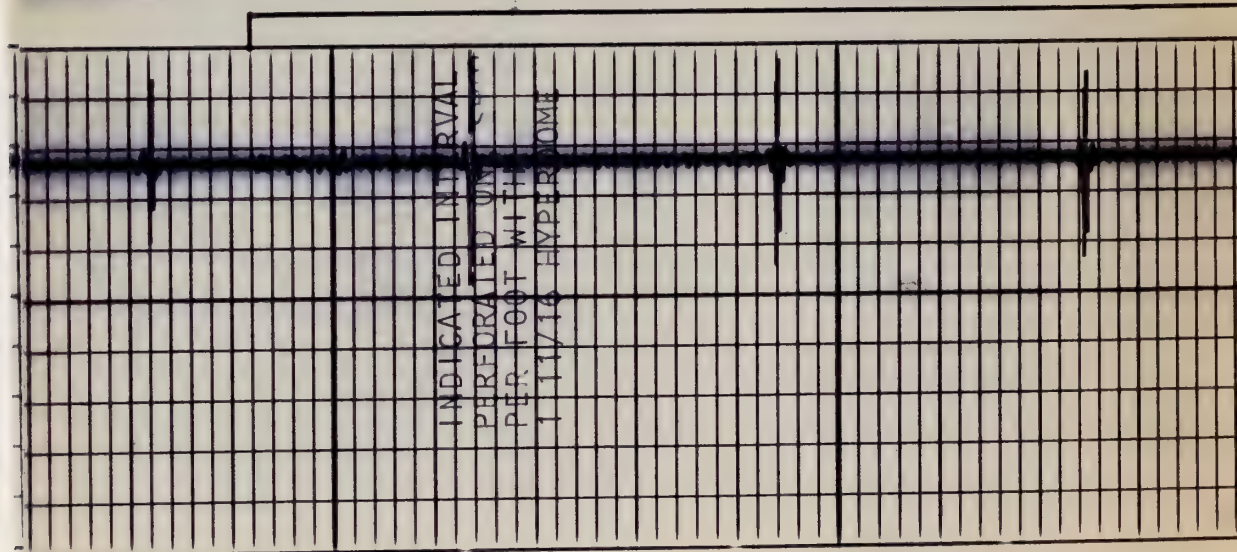


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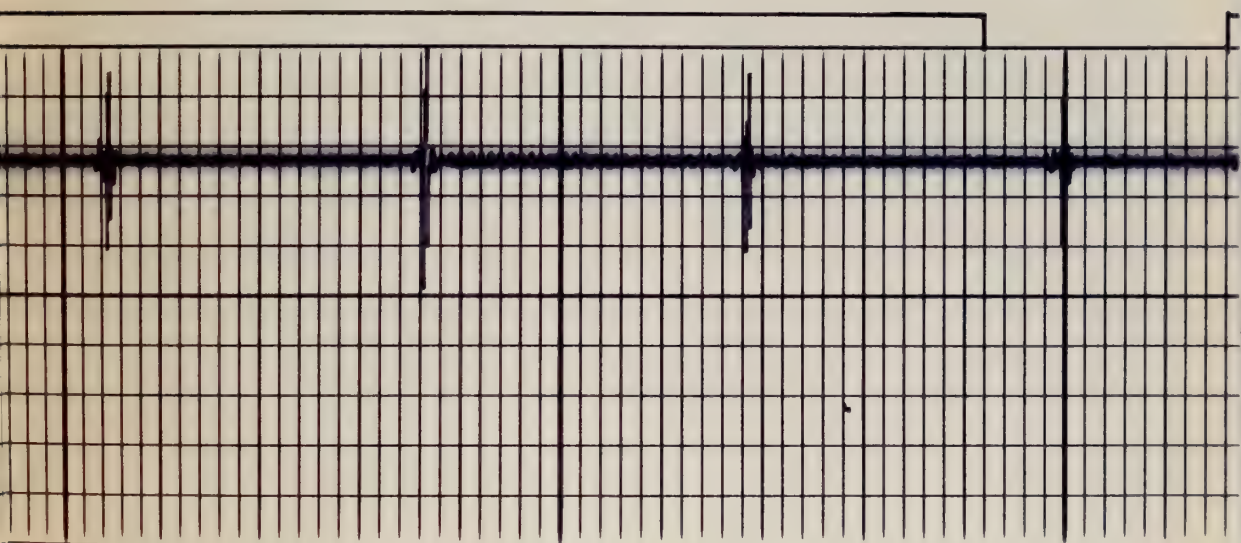
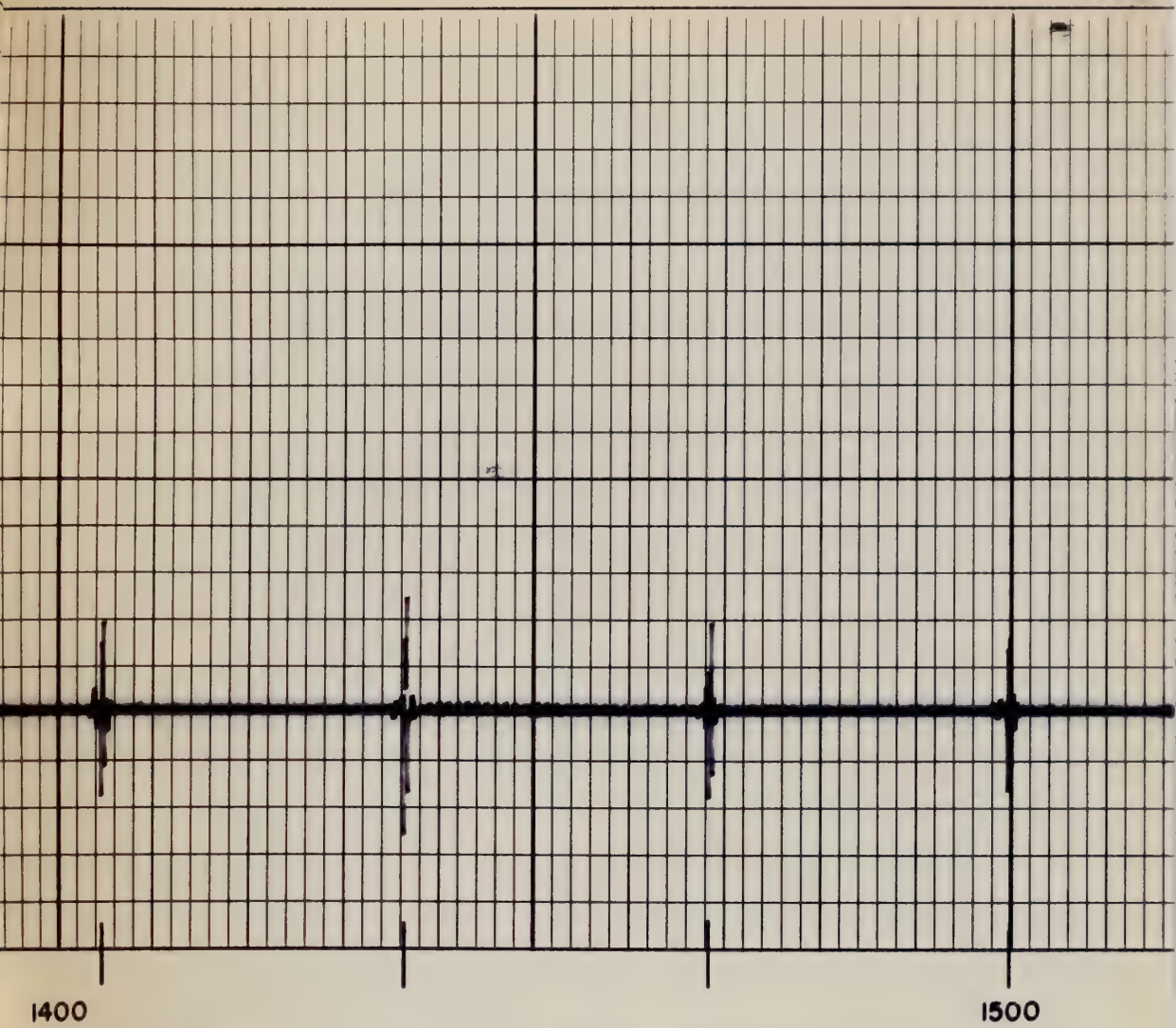




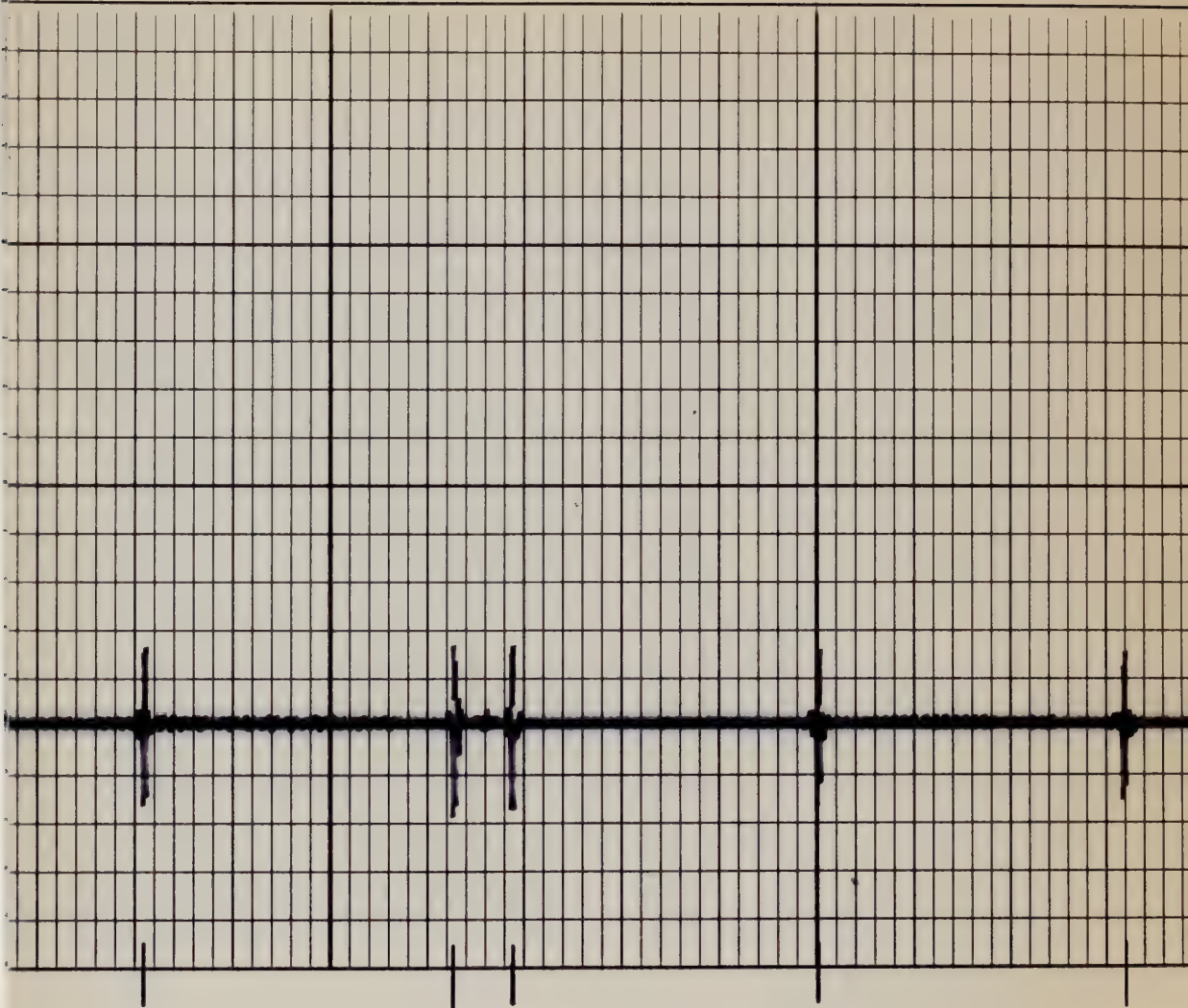
1300



INDICATED INTERVAL
PERFORATED ON 11/17/14
PER FOOT WITH
11/17/14 HYPERDOME

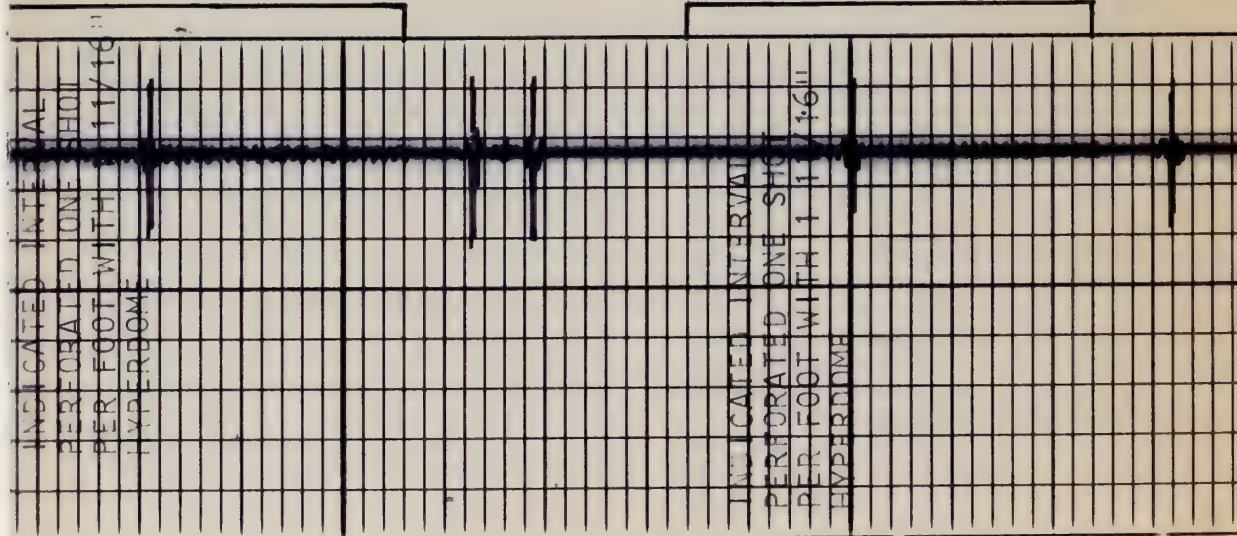


INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH 11/16"
HYPERDOME



1600

INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOOT WITH 11/16"
HYPERDOME

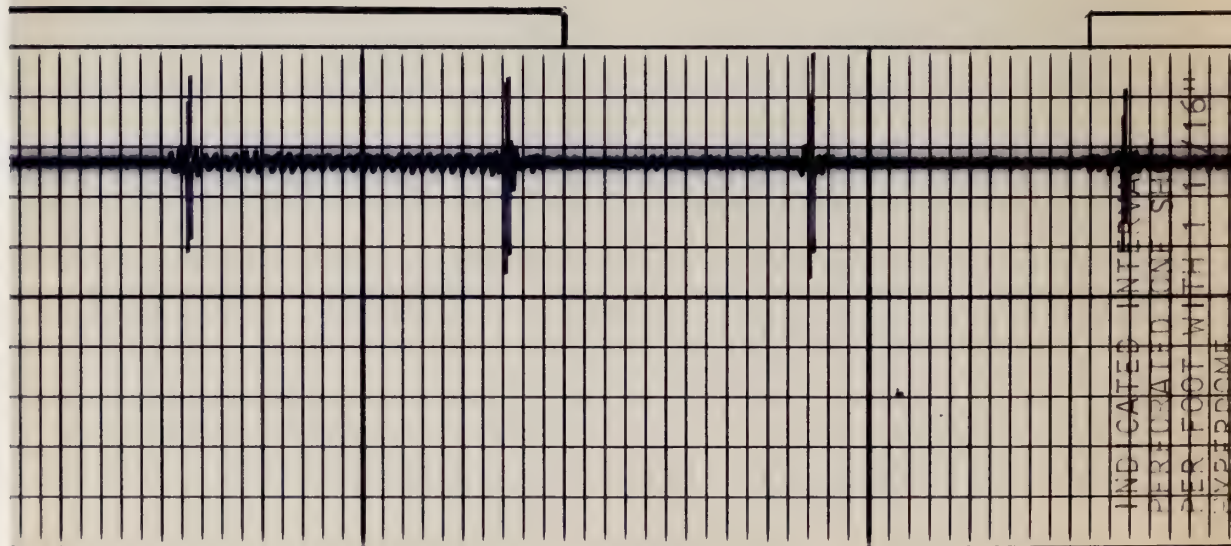




UNGATED INTERVAL
PERFORATED ONE SH
PER FOOT WITH 1 1/16"
HYPERDOME



1800



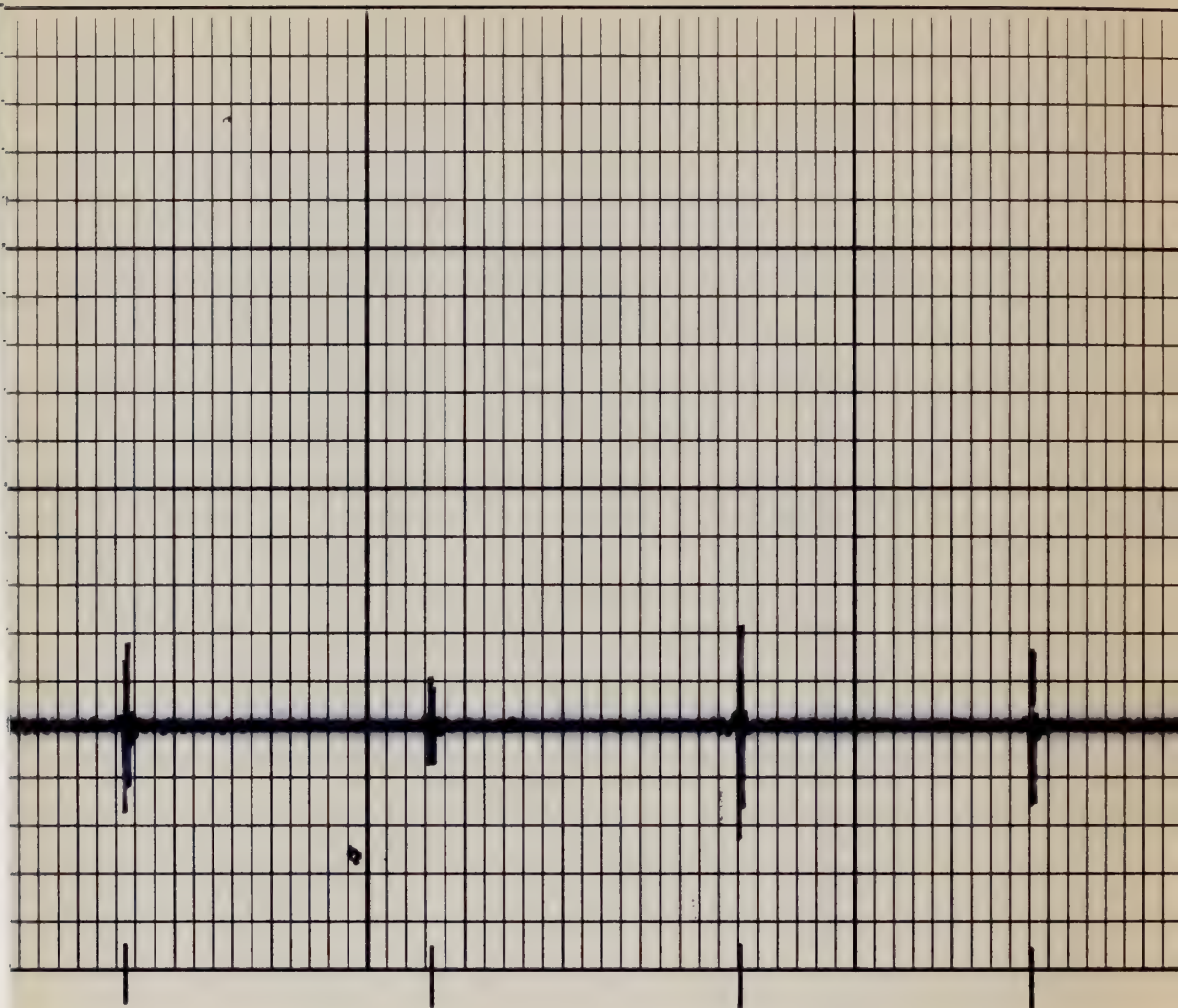
INDICATED INTERVAL
PERFORATED ONE SET
PER FOOT WITH 1 1/16"
EVERYONE

1900

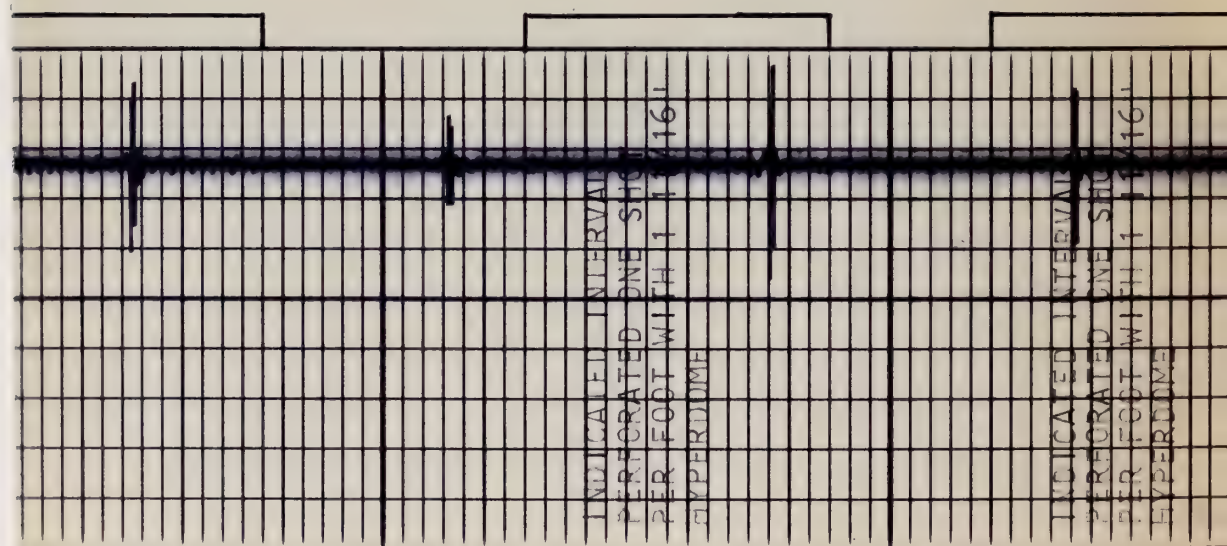
2000

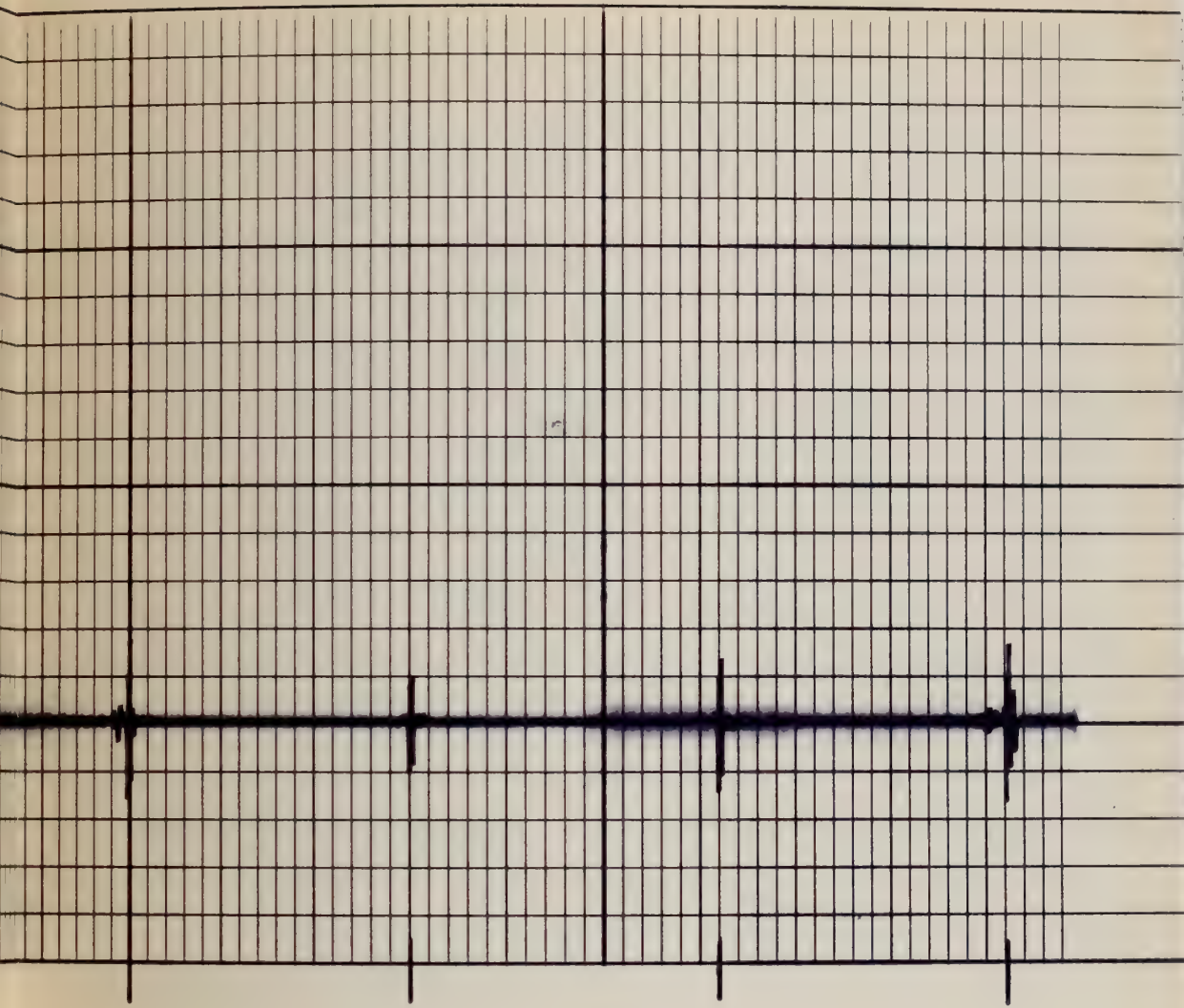
INDICATED INTERVAL
PERFORATED ONE SHEET
PER FOOT WITH 1 1/2 16"
HYPERDOME

INDICATED INTERVAL
PERFORATED ONE SHEET
PER FOOT WITH 1 1/2 16"
HYPERDOME

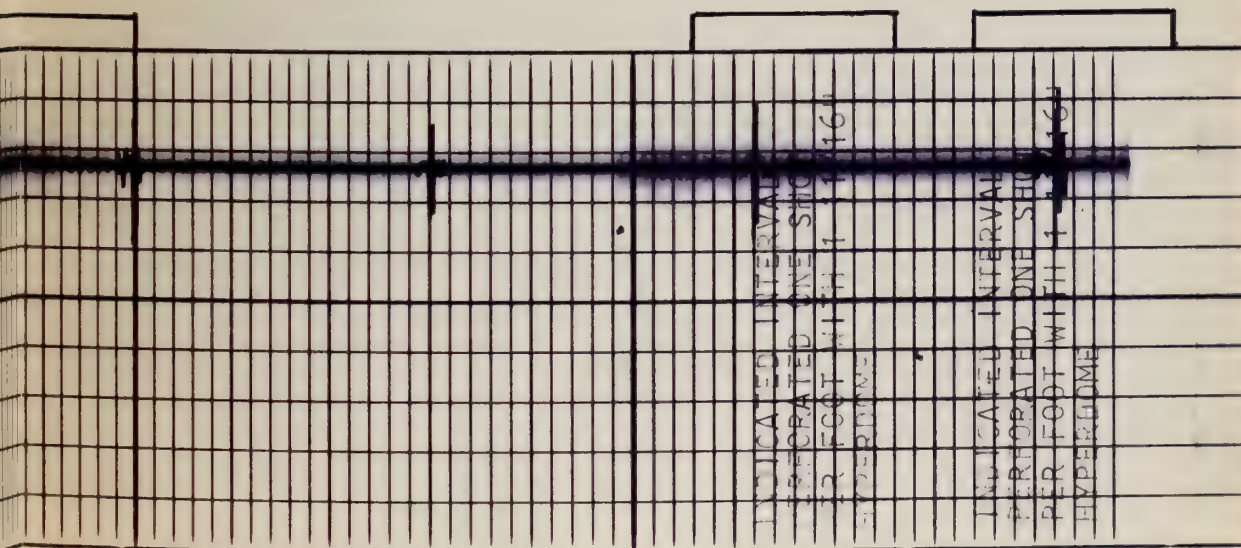


2100



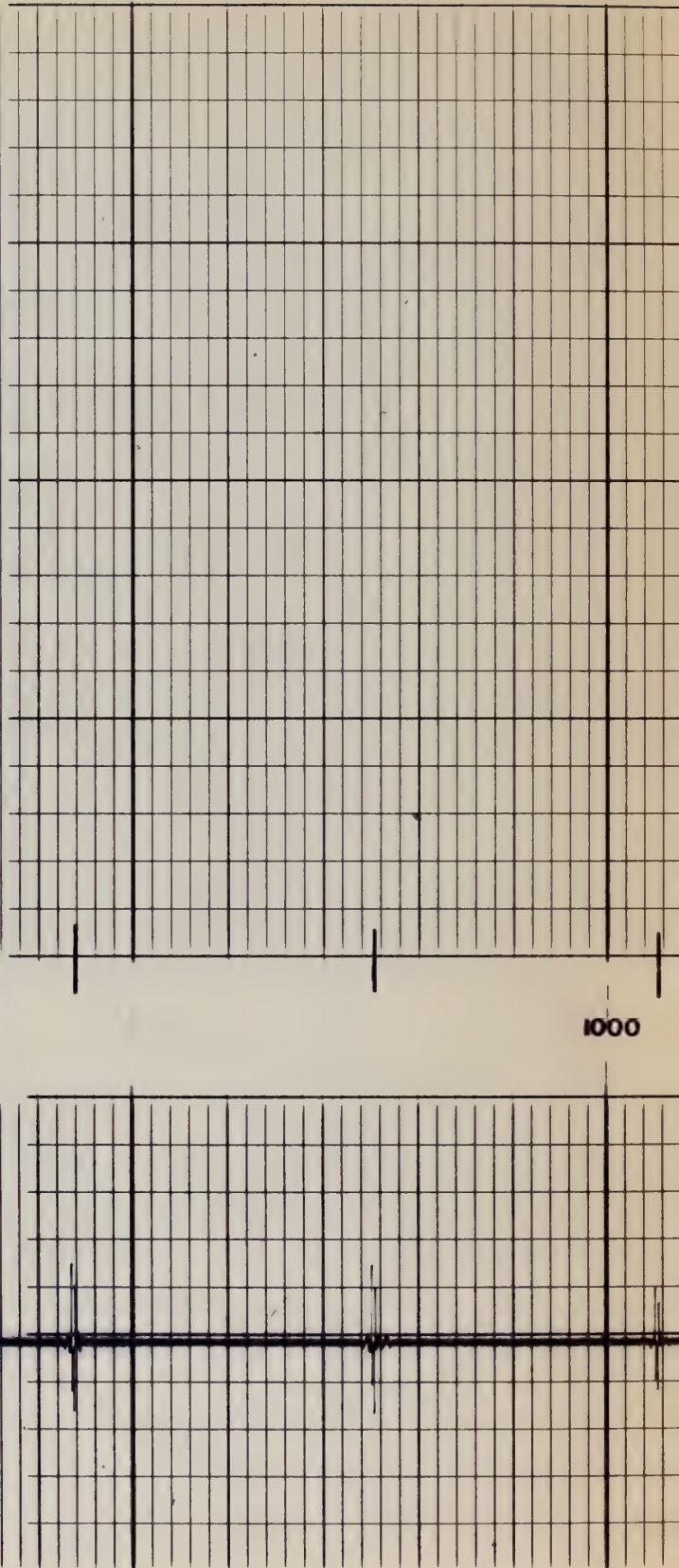


2200

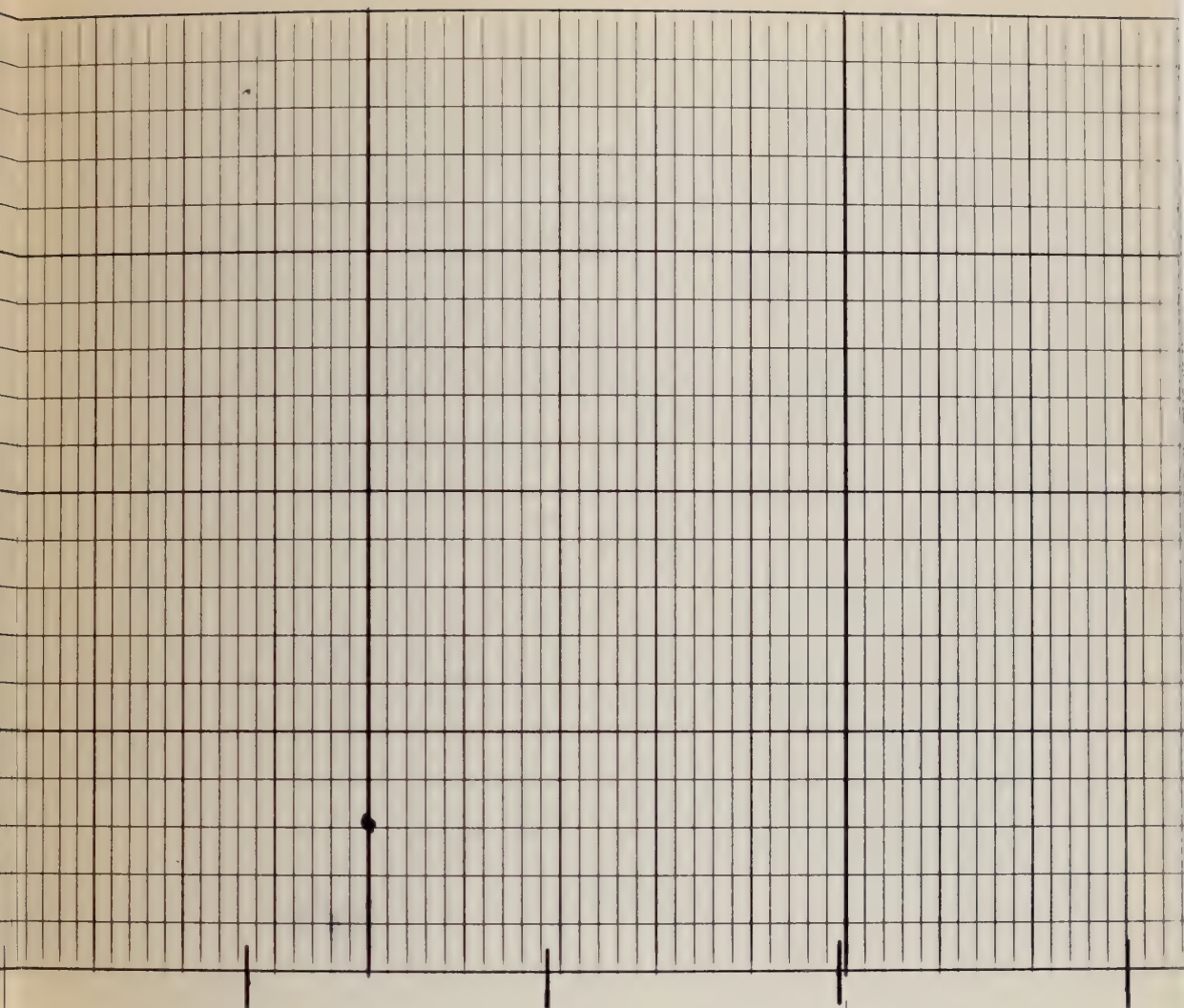




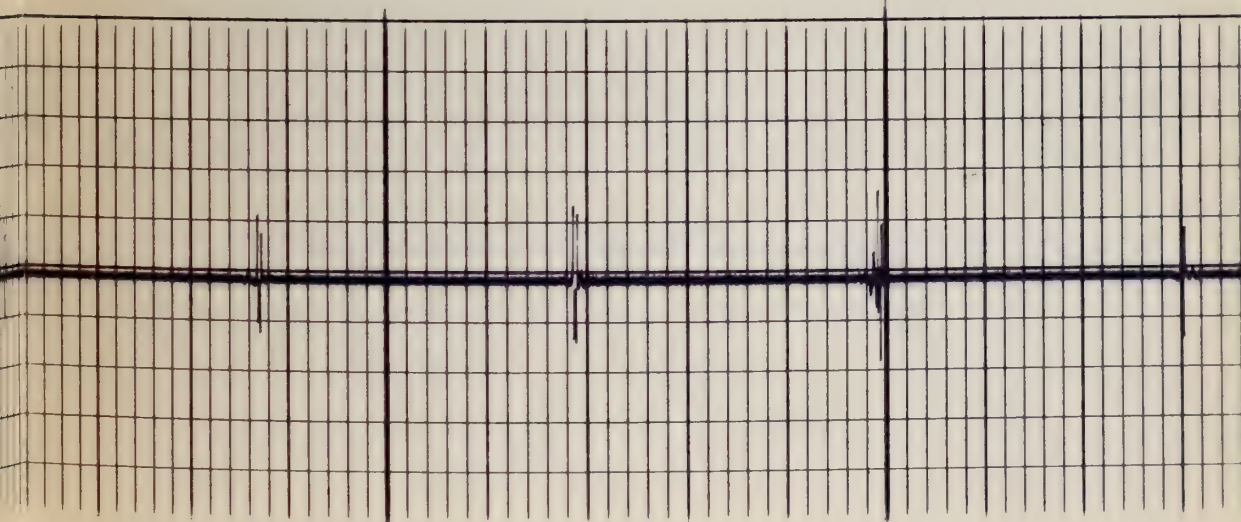
NO. 2 - SHORT STRING-COLLAR LOG RUN BEFORE PERFORATING

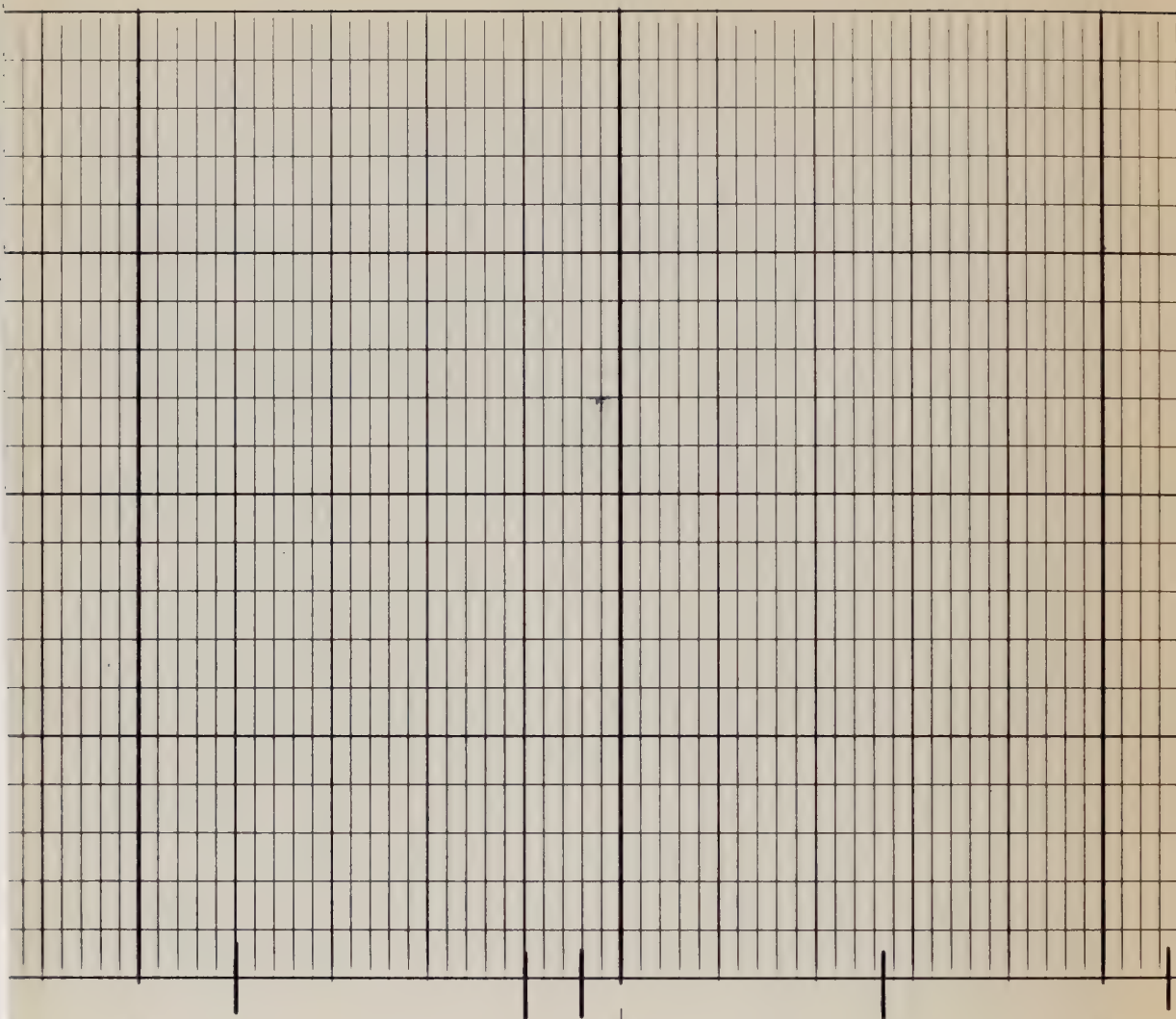


1000

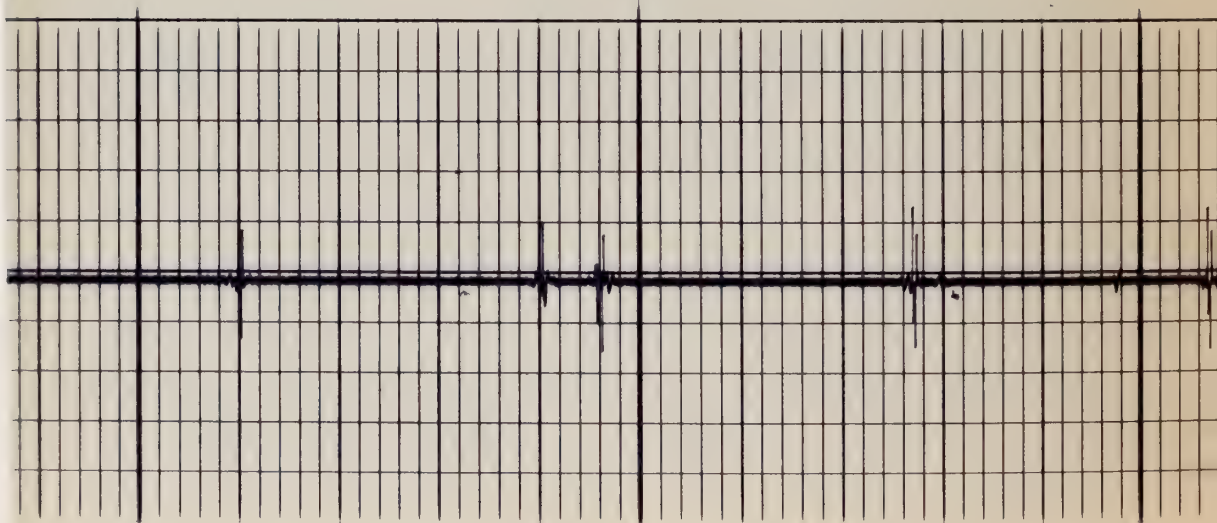


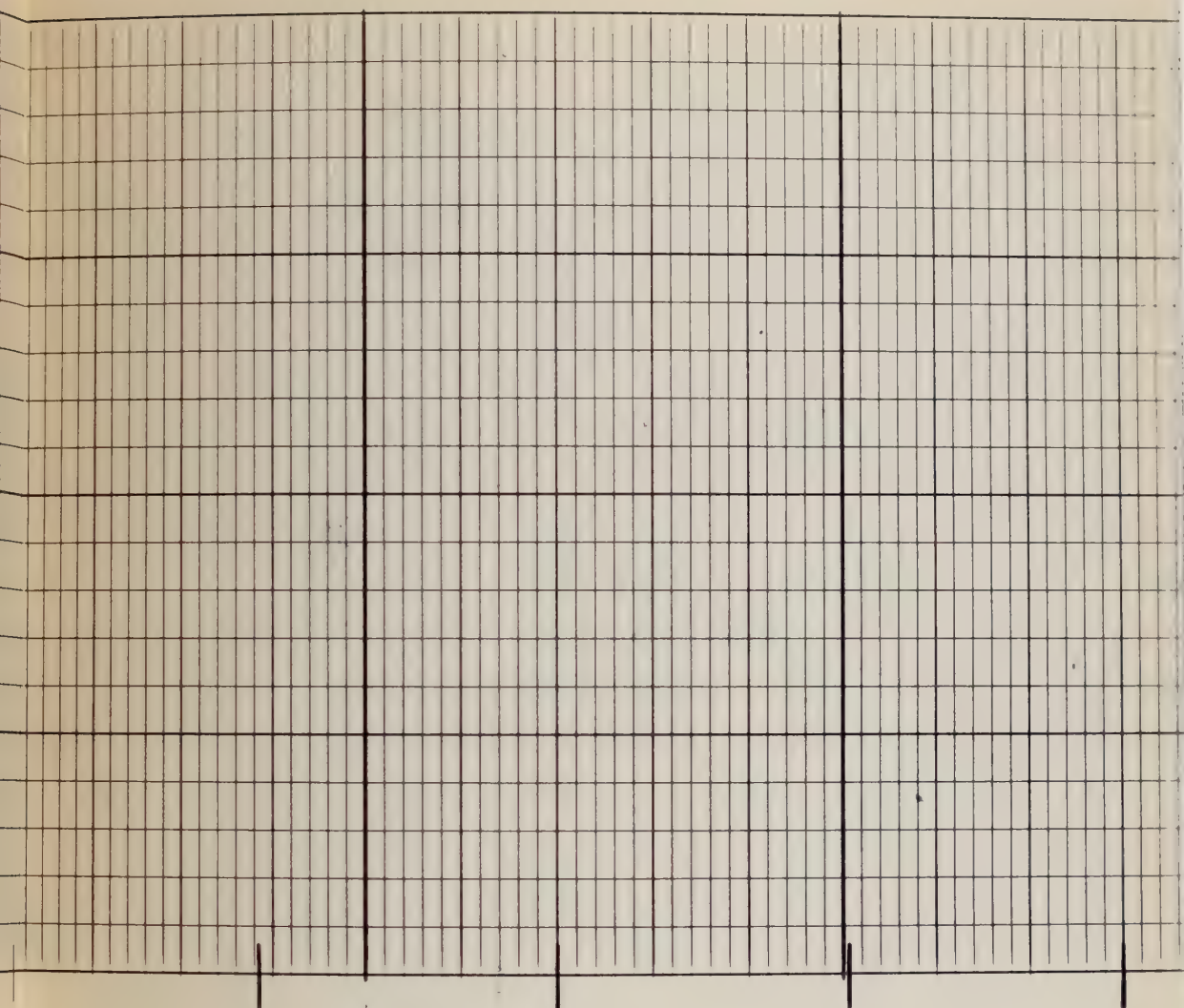
1100



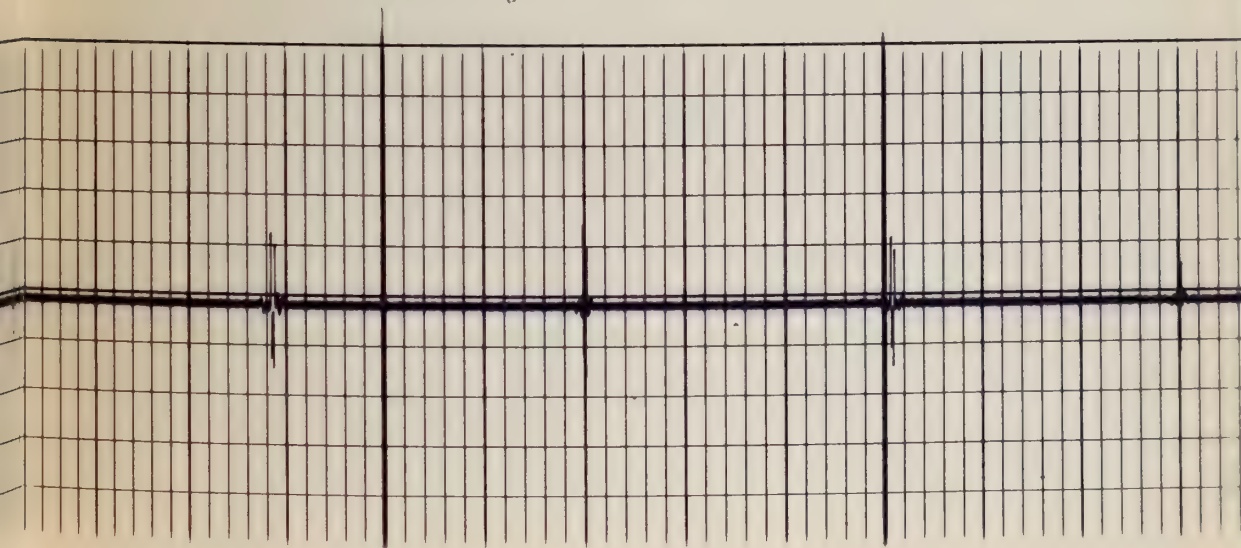


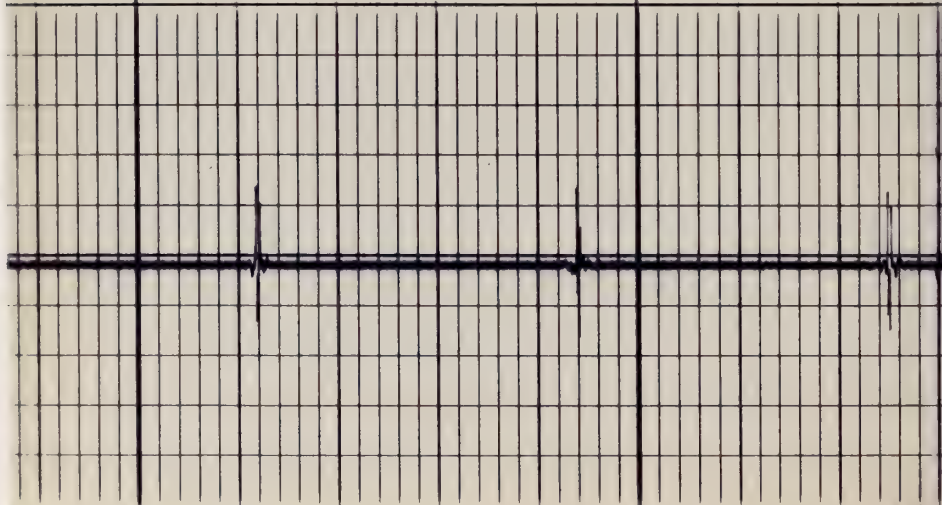
200



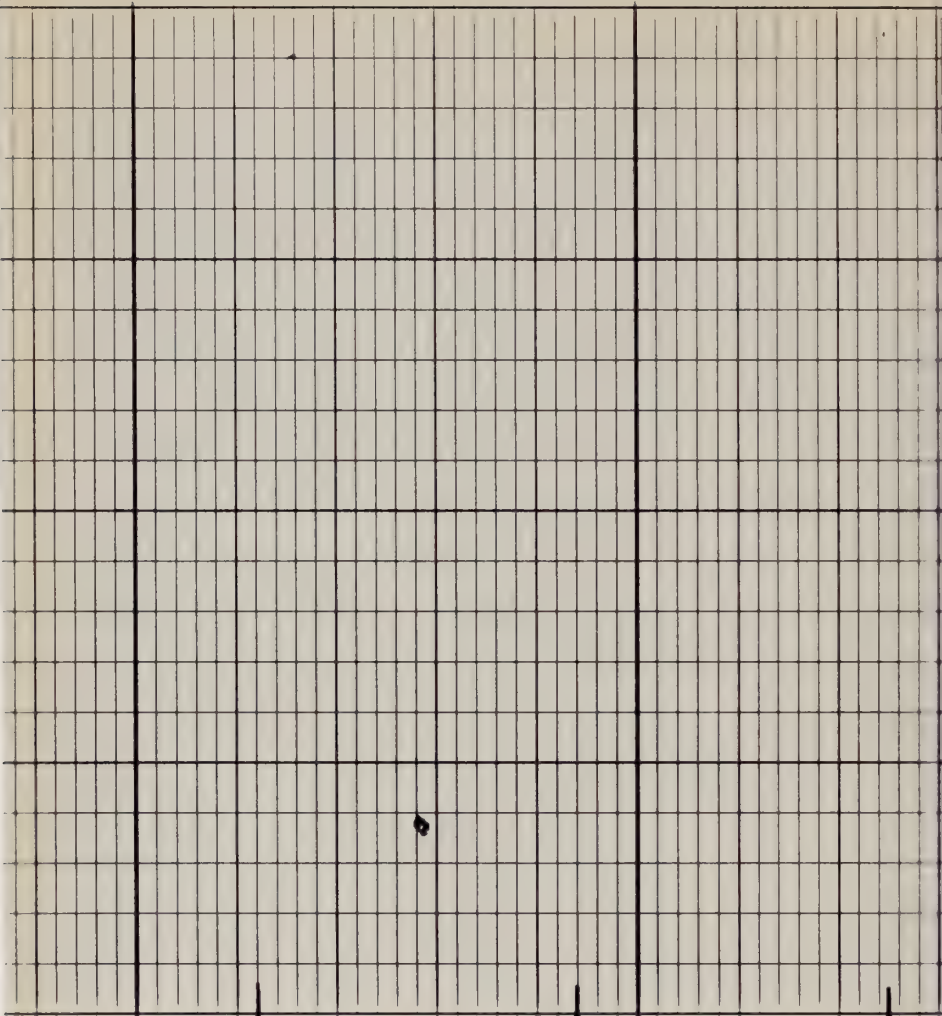


1300



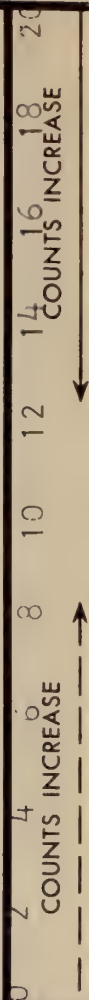


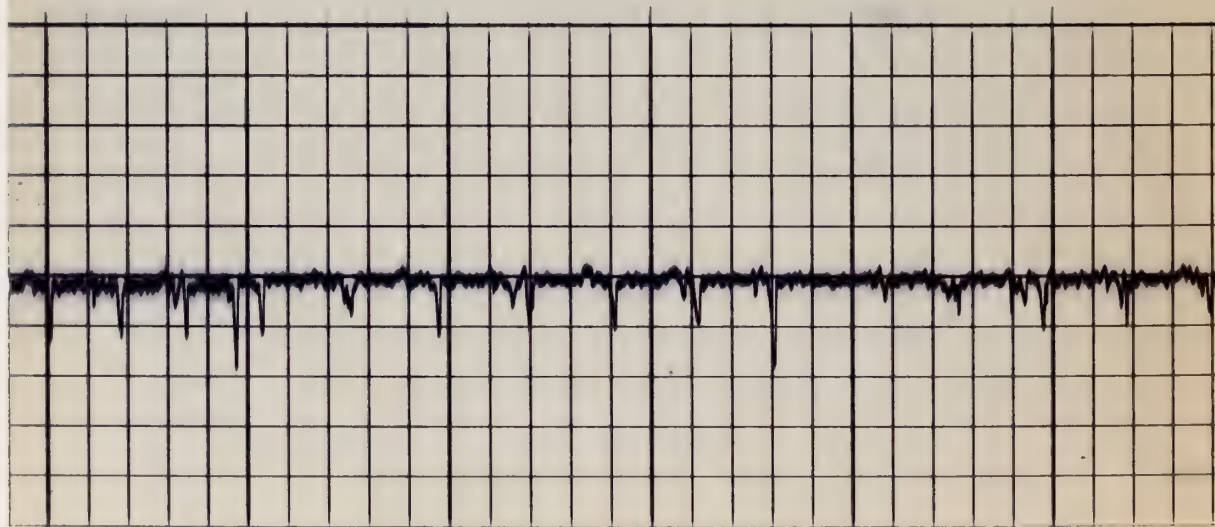
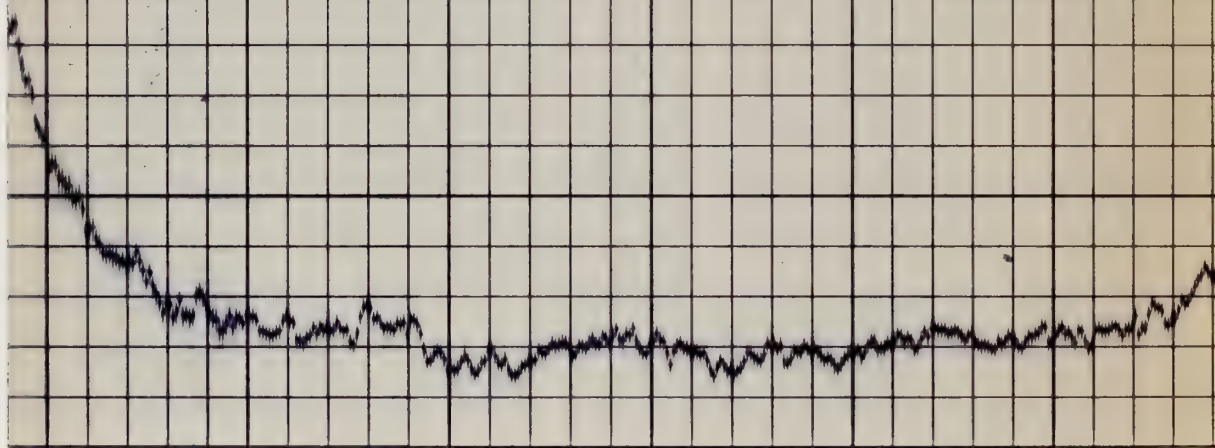
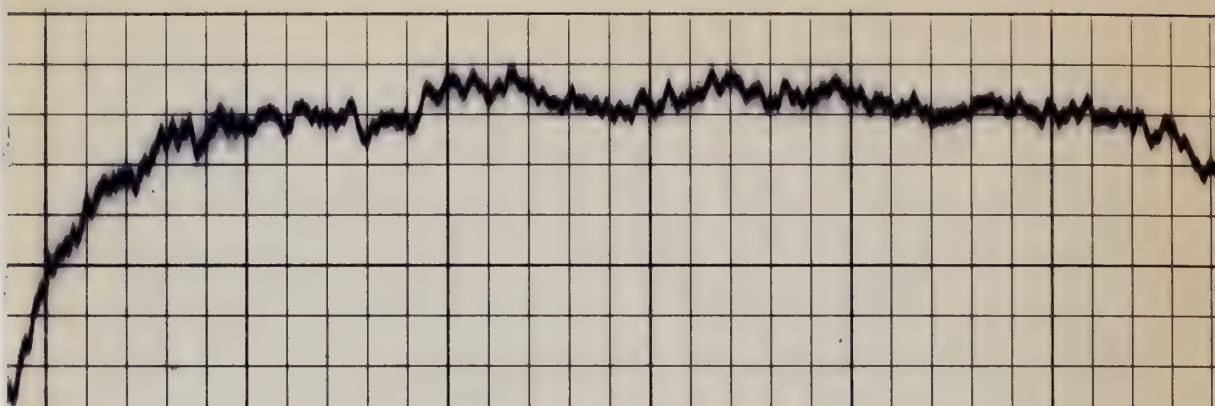
1400

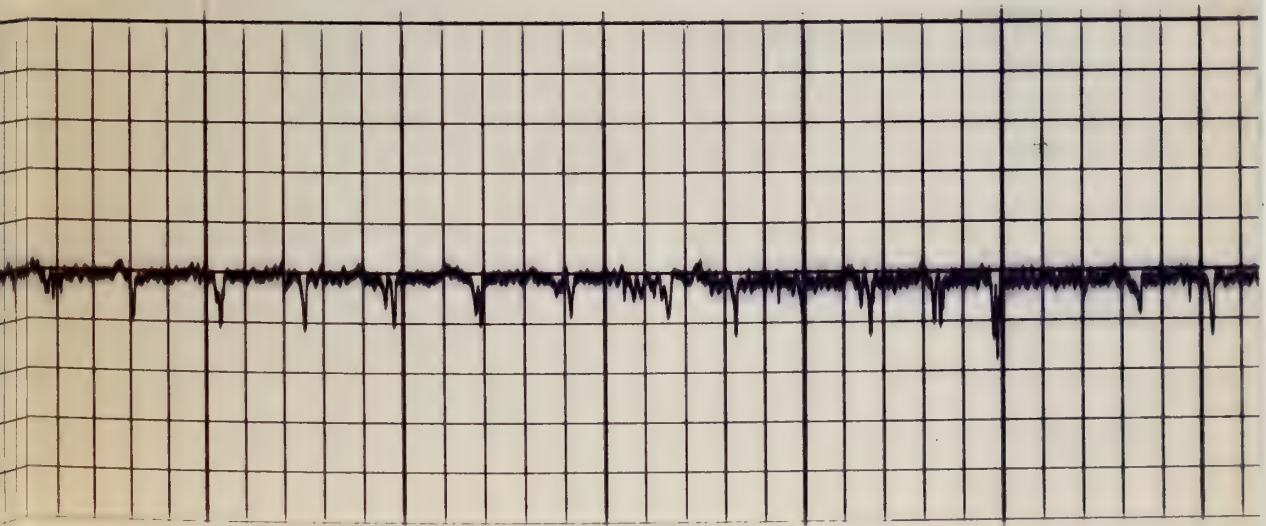
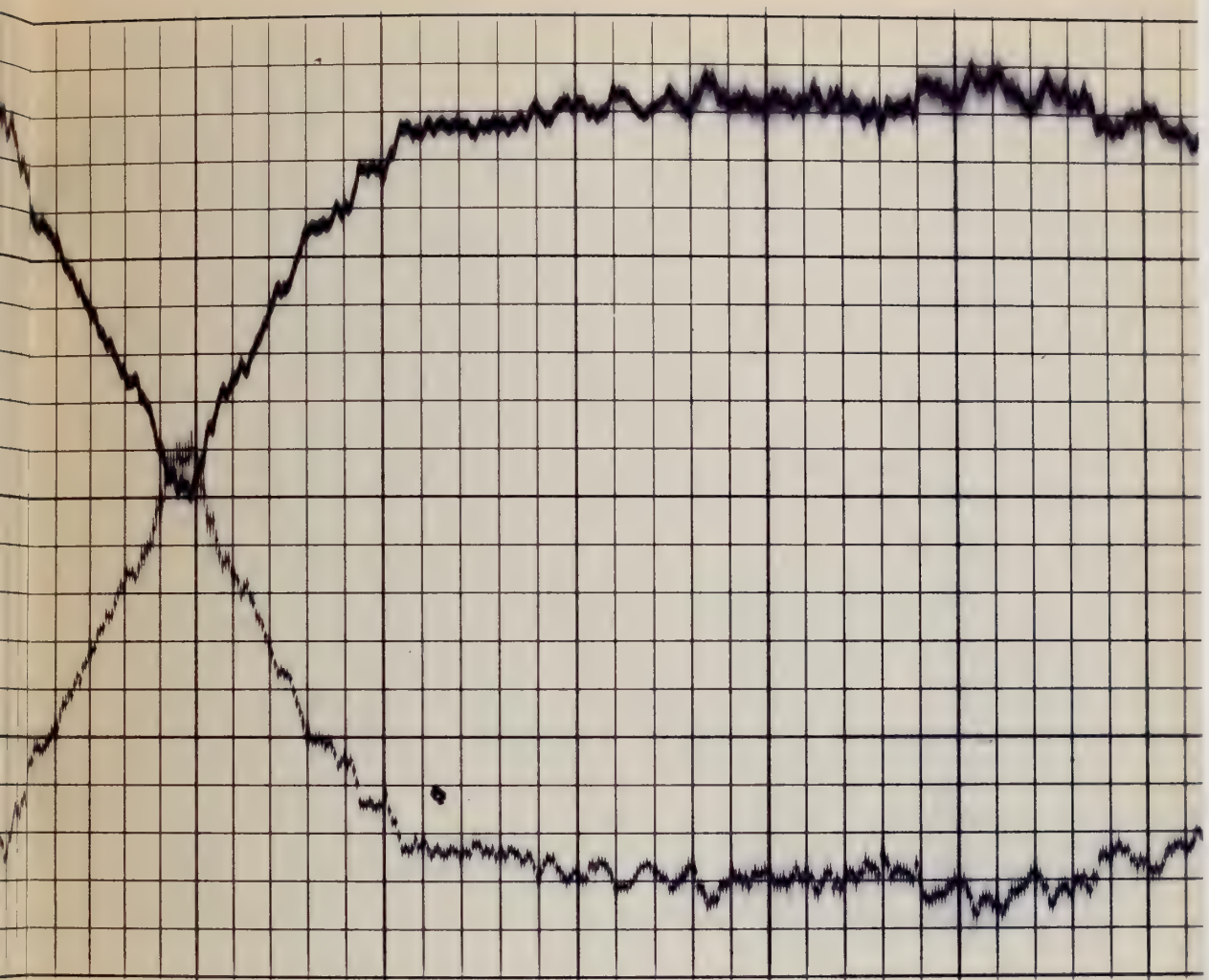


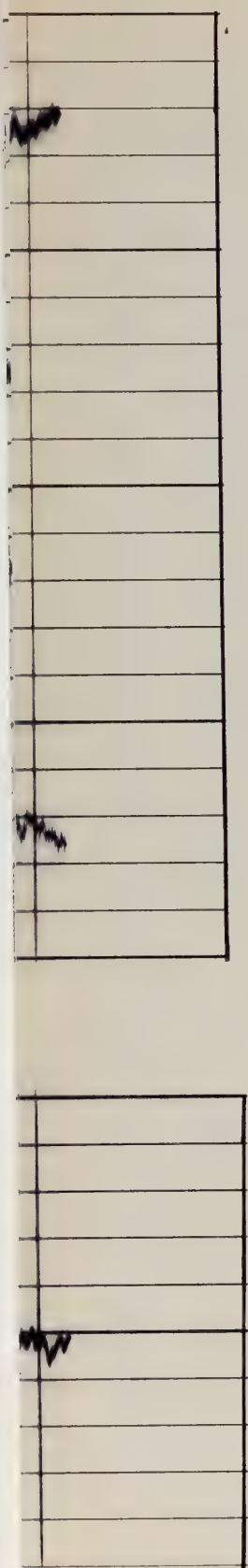
INDEXING
RECORD

RADIATION
RECORD





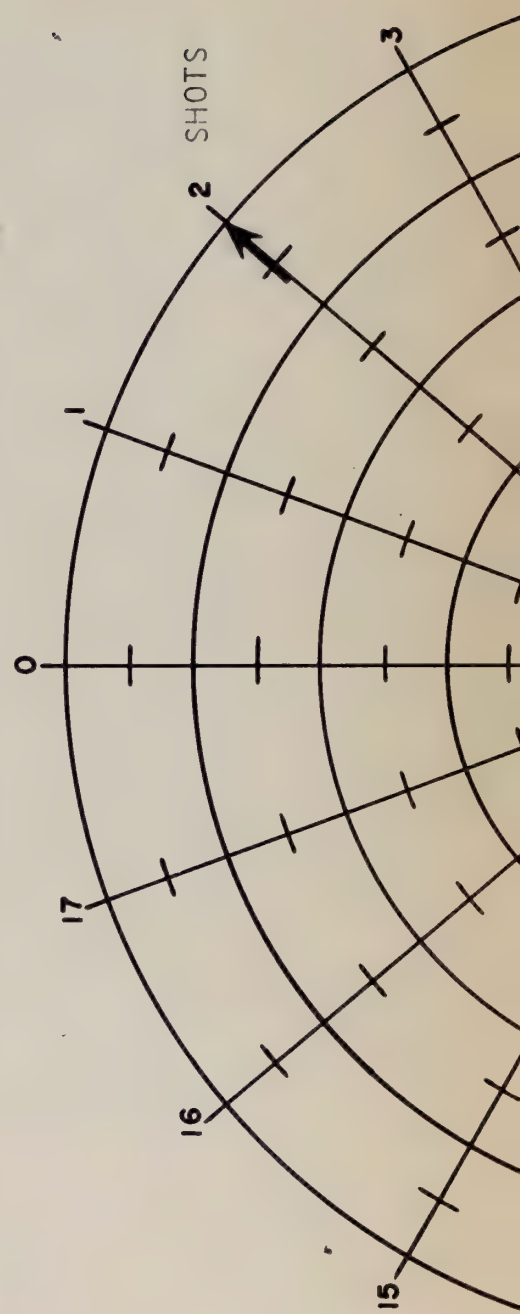


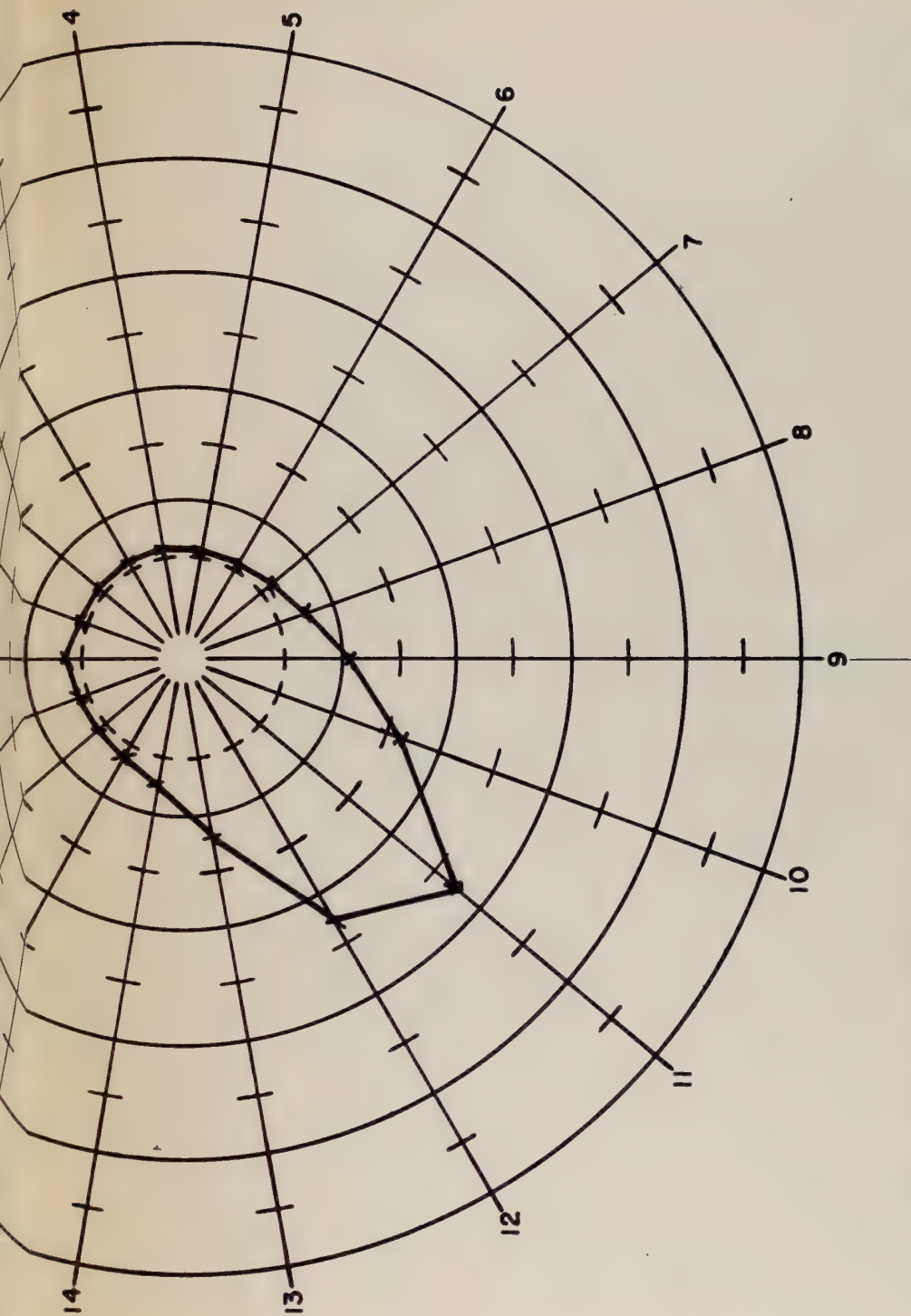


RADIO-ORIENTATION PLOT

'POT-B

NO. 2-SHORT STRING-11 SHOTS GUN NO. 1 PERFORATIONS 1218-1228 ONE SHOT PER FOOT





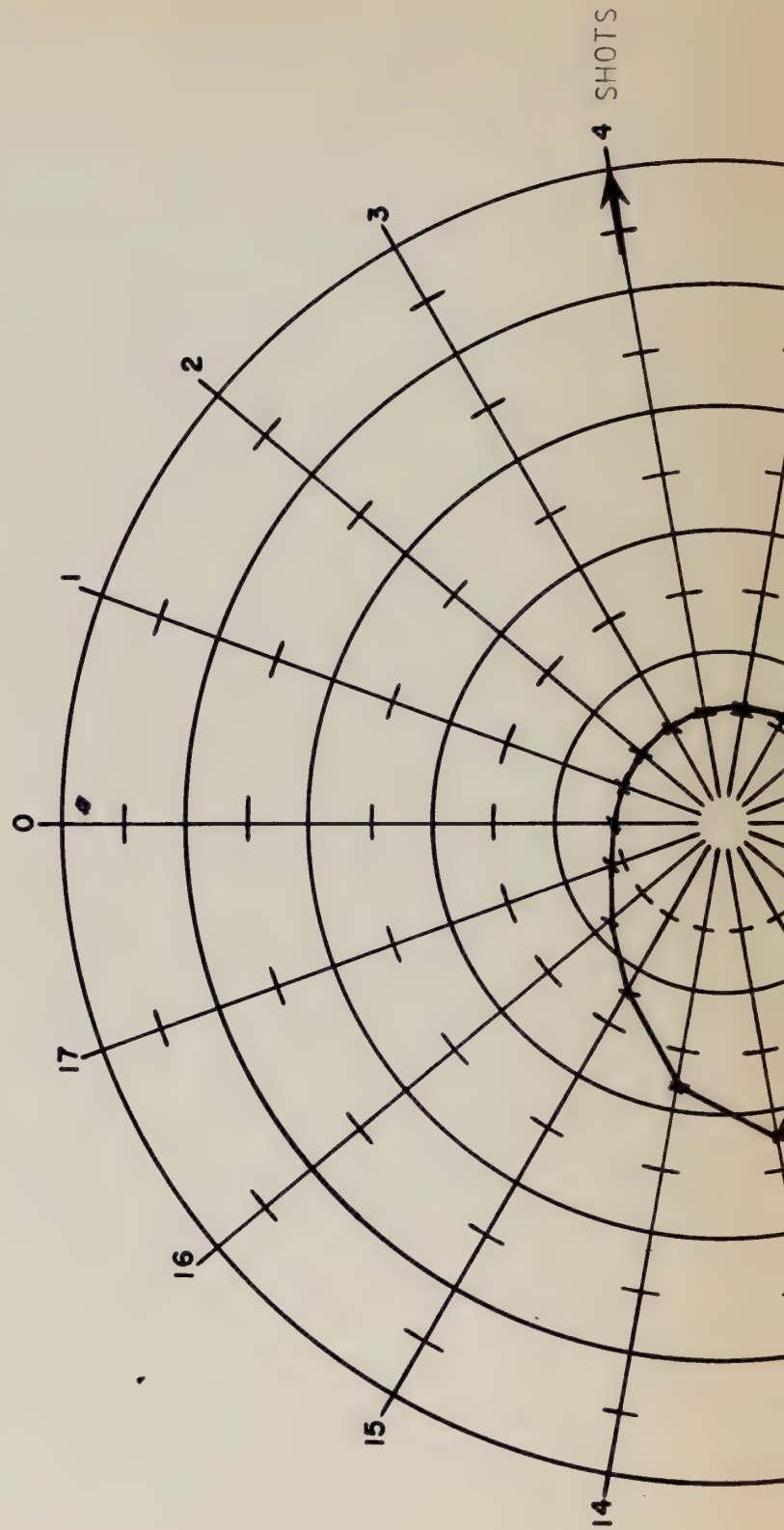
This chart, compilation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

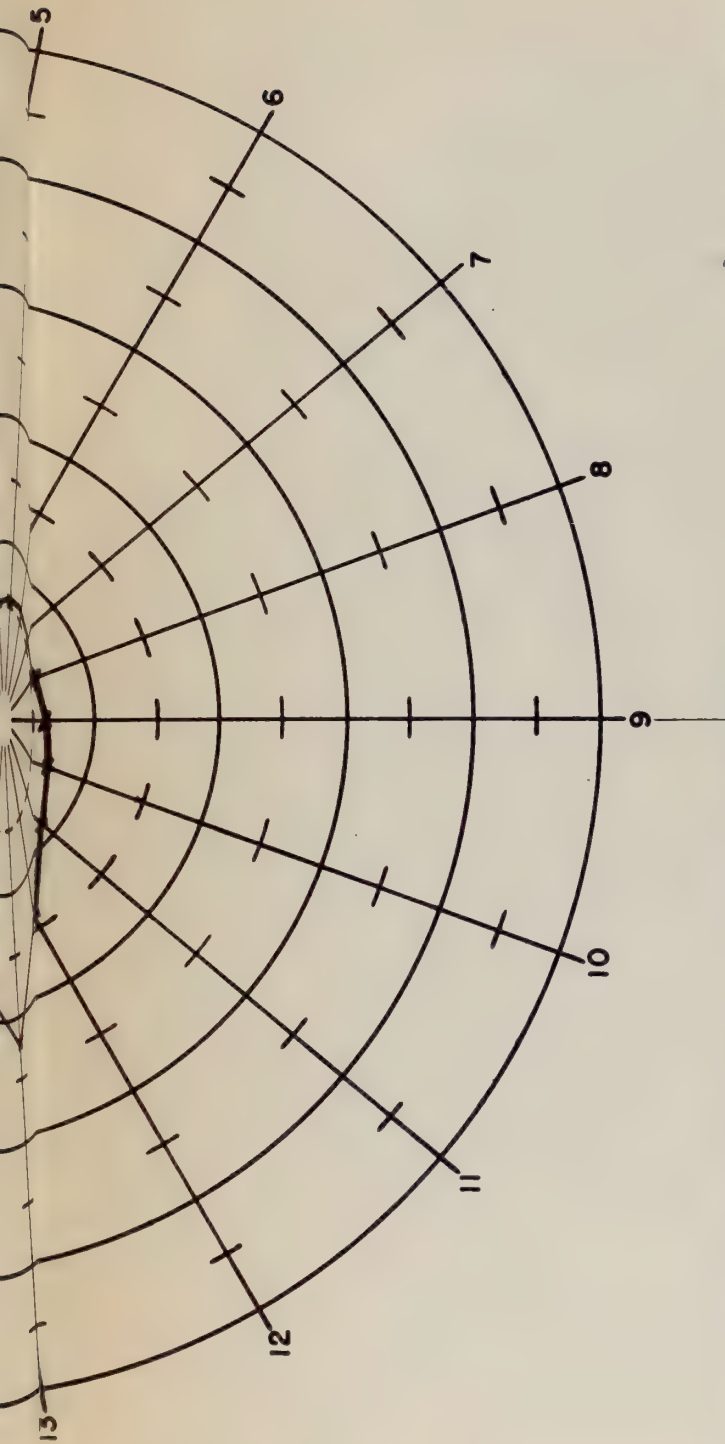
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO.2-SHORT STRING-11 SHOTS GUN NO.2 PERFORATIONS 1207-1217 ONE SHOT PER FOOT



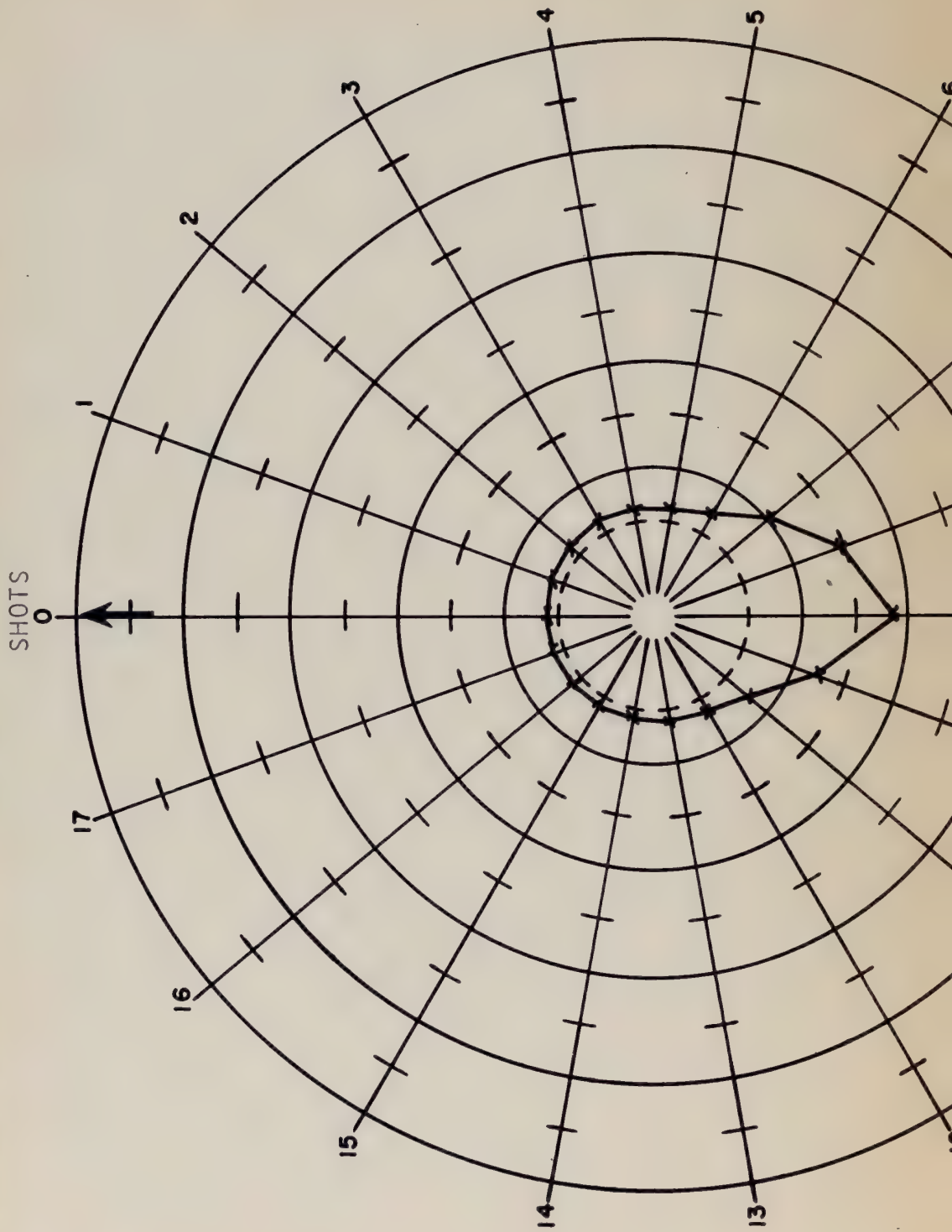


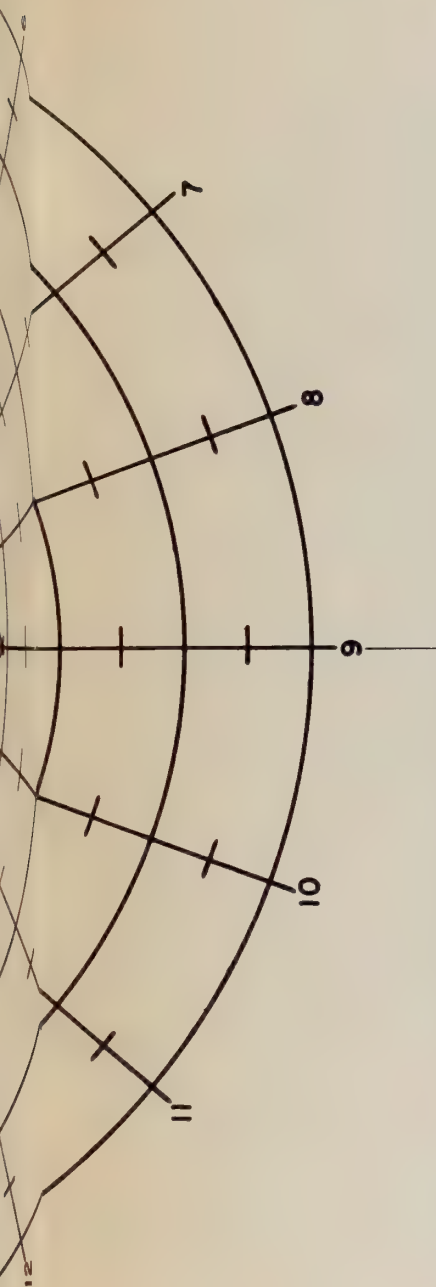
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIORIENTATION PLOT POT-B

NO.2 2-SHORT STRING-11 SHOTS GUN NO.3 PERFORATIONS 1196-1206 ONE SHOT PER FOOT





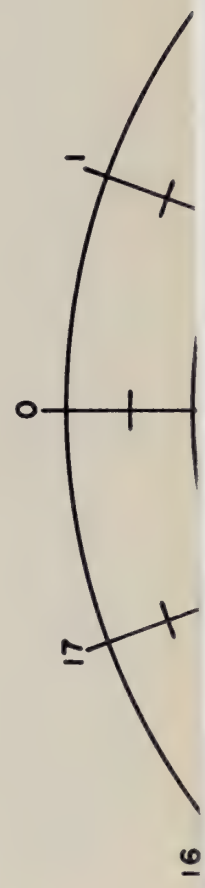
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

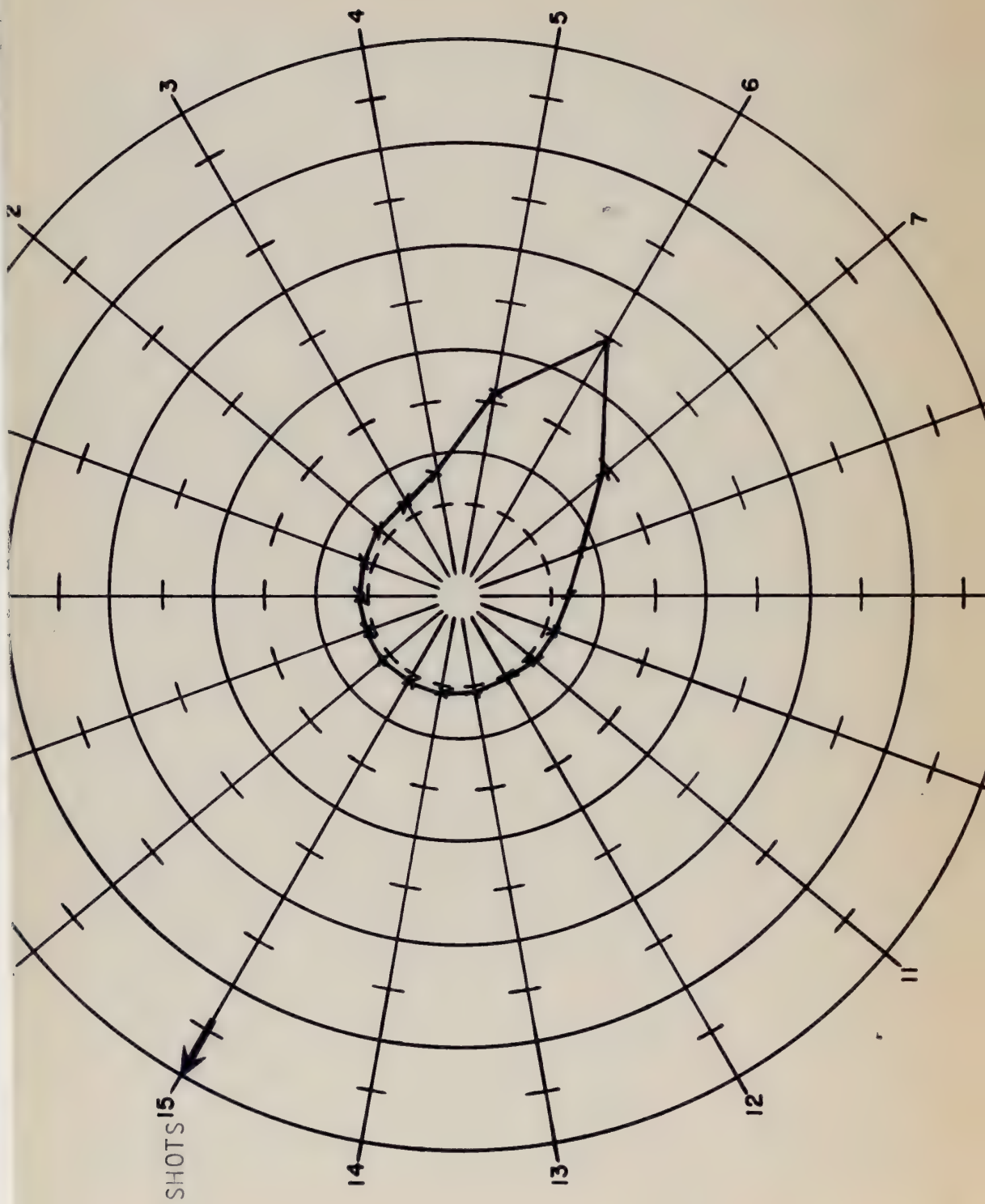


RADIOORIENTATION PLOT

POT-B

NO. 2-SHORT STRING-11 SHOTS GUN NO. 4 PERFORATIONS 1185-1195 ONE SHOT PER FOOT





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

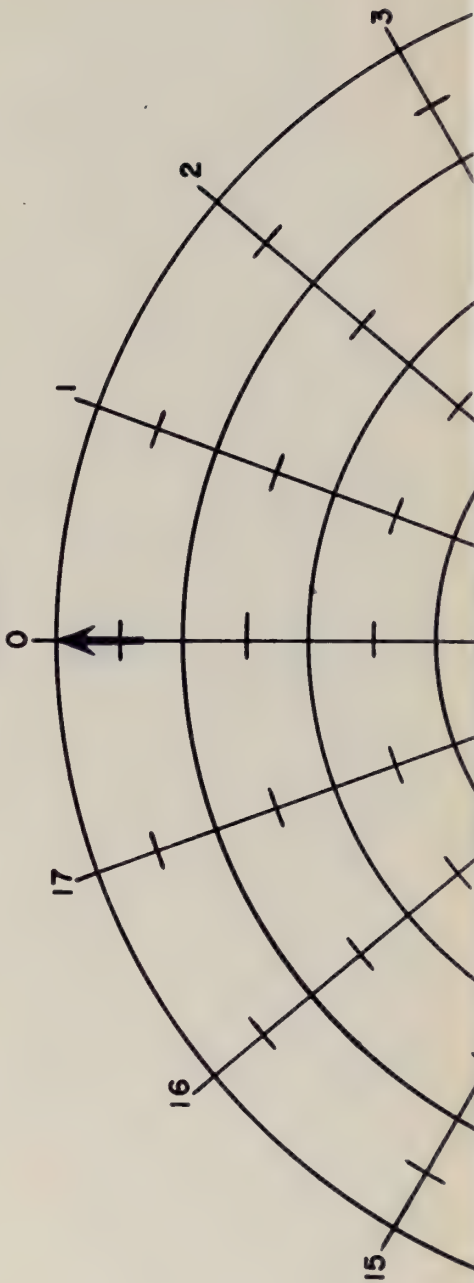
Schlumberger

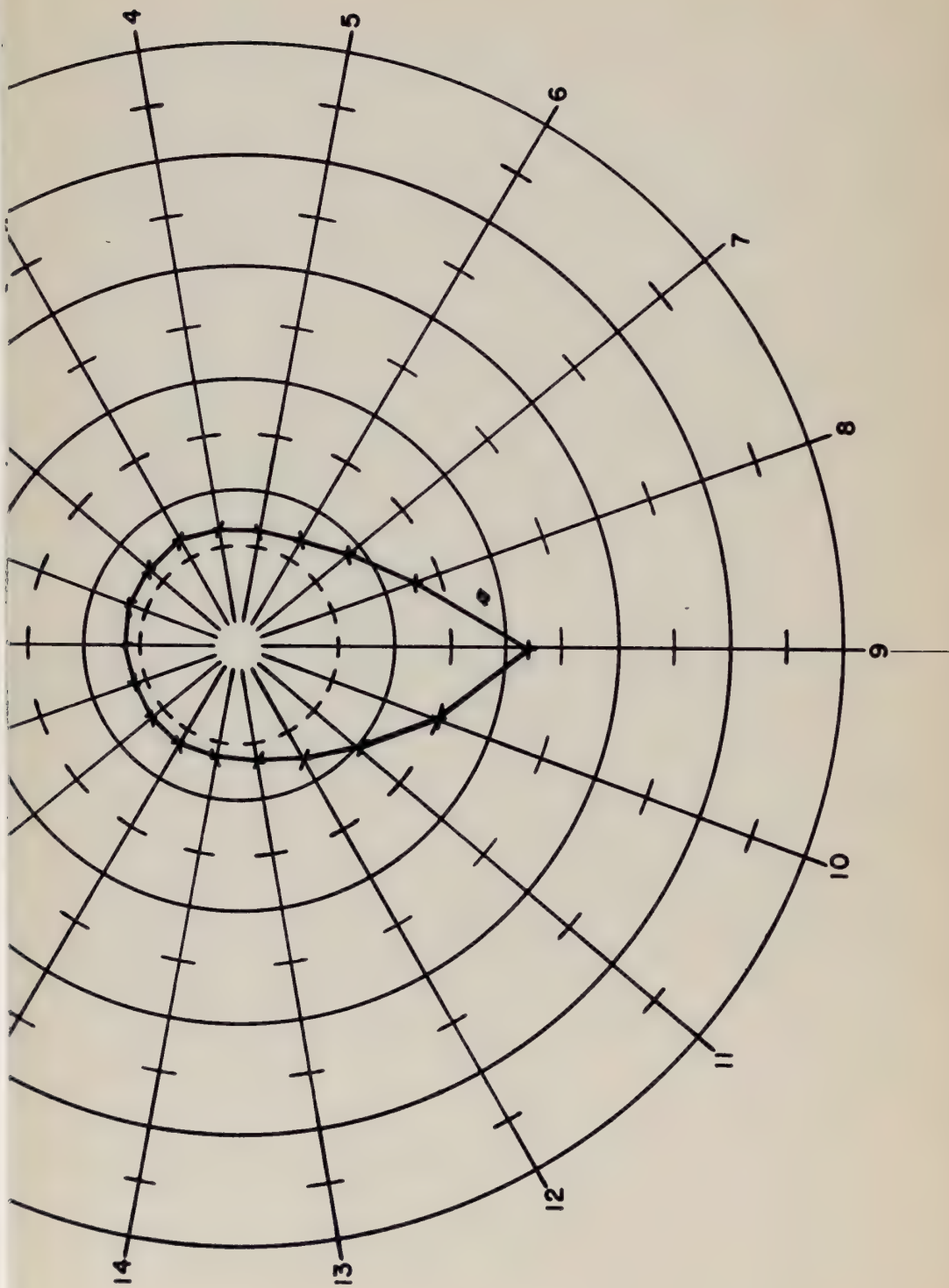
RADIOORIENTATION PLOT

POT-B

NO. 2-SHORT STRING-11 SHOTS GUN NO. 5 PERFORATIONS 1174-1184 ONE SHOT PER FOOT

SHOTS





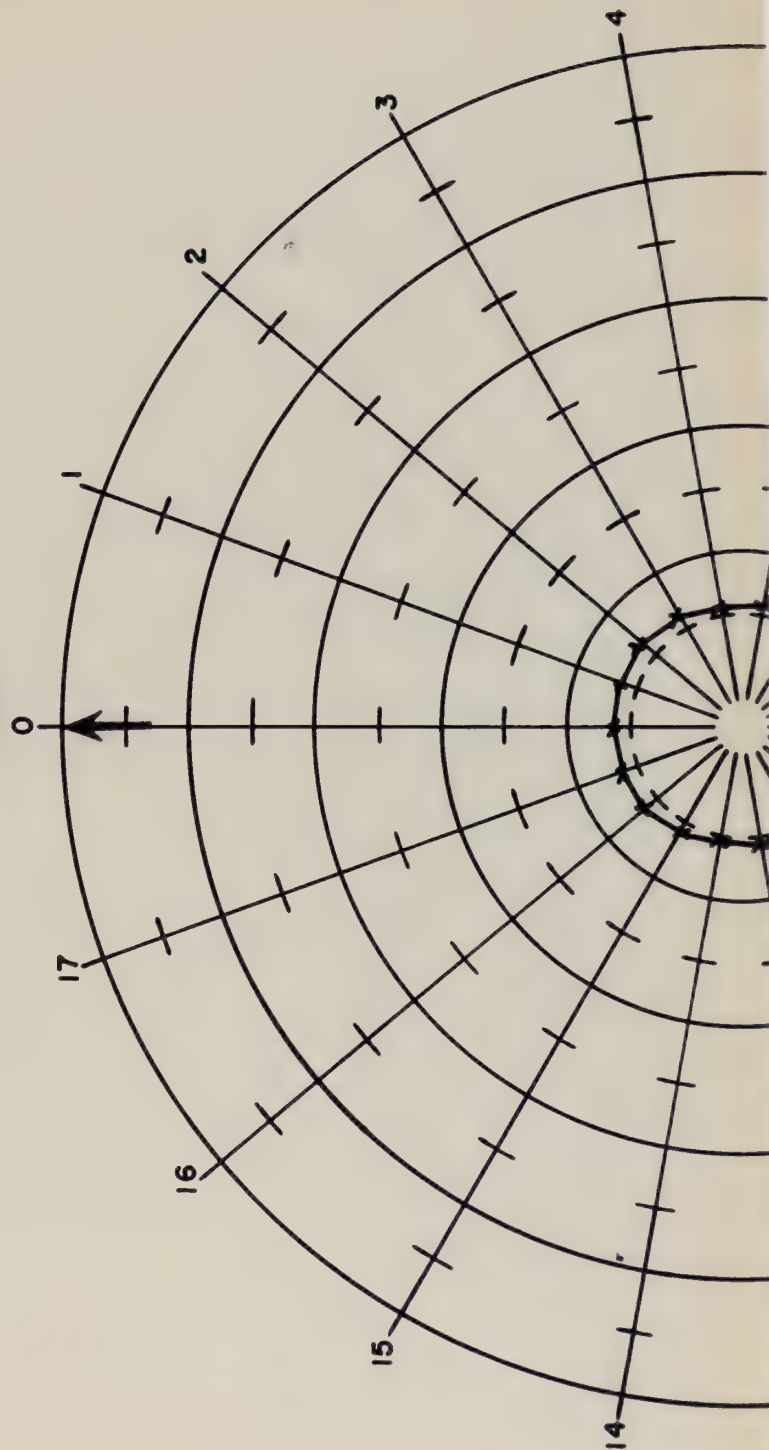
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

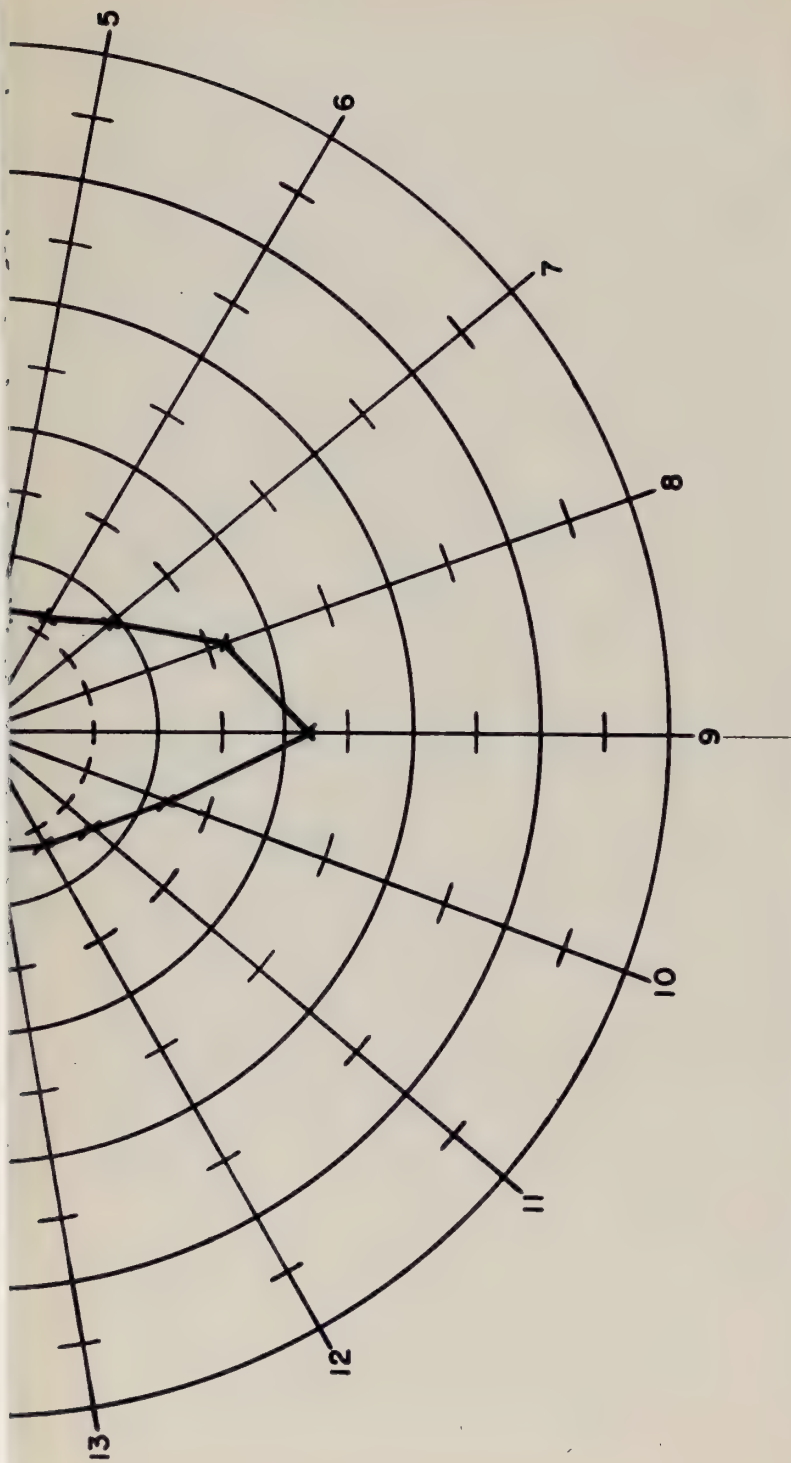
RADIOORIENTATION PLOT

POT-B

NO.2-SHORT STRING-11 SHOTS GUN NO.6 PERFORATIONS 1163-1173 ONE SHOT PER FOOT

SHOTS



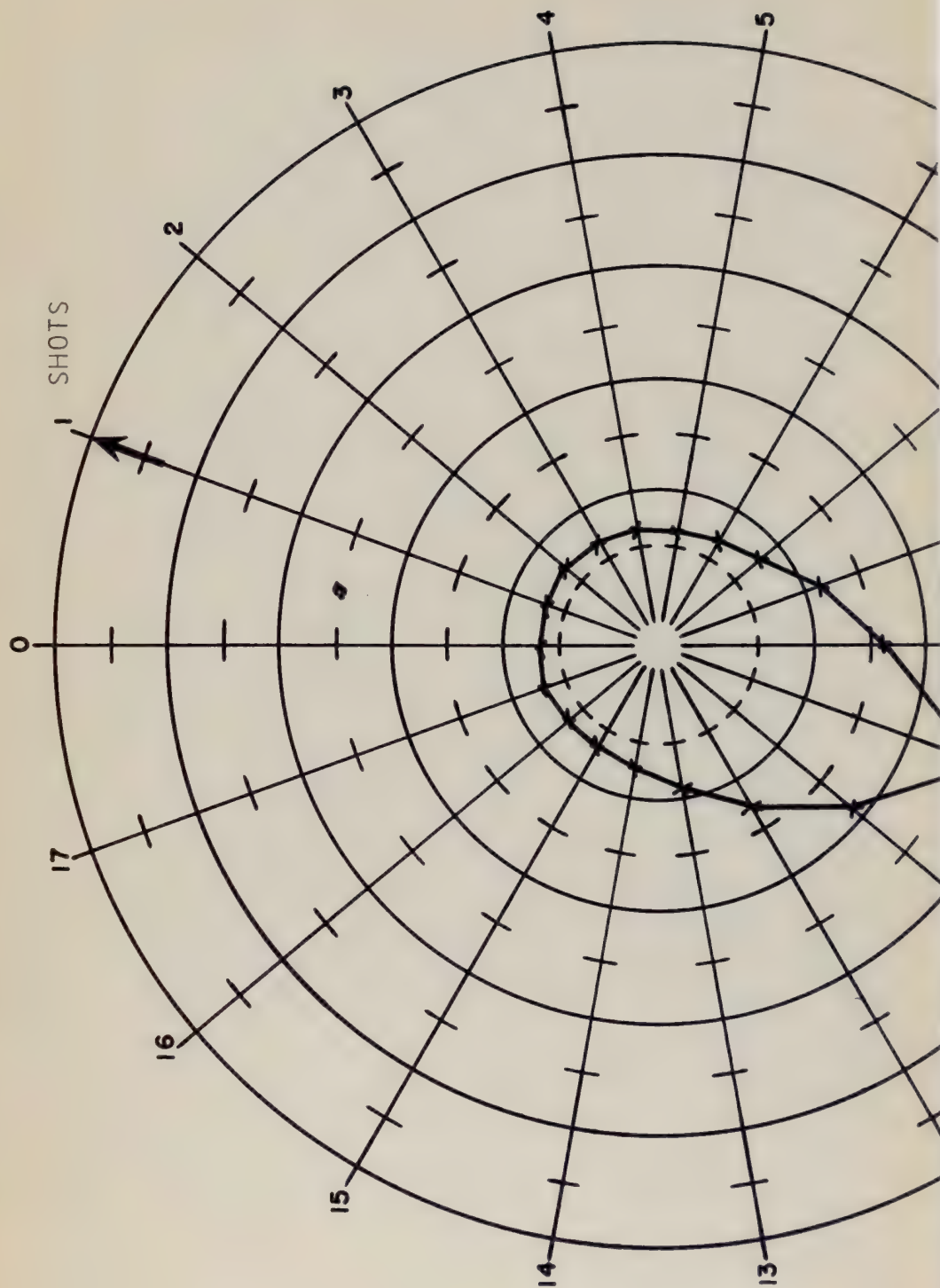


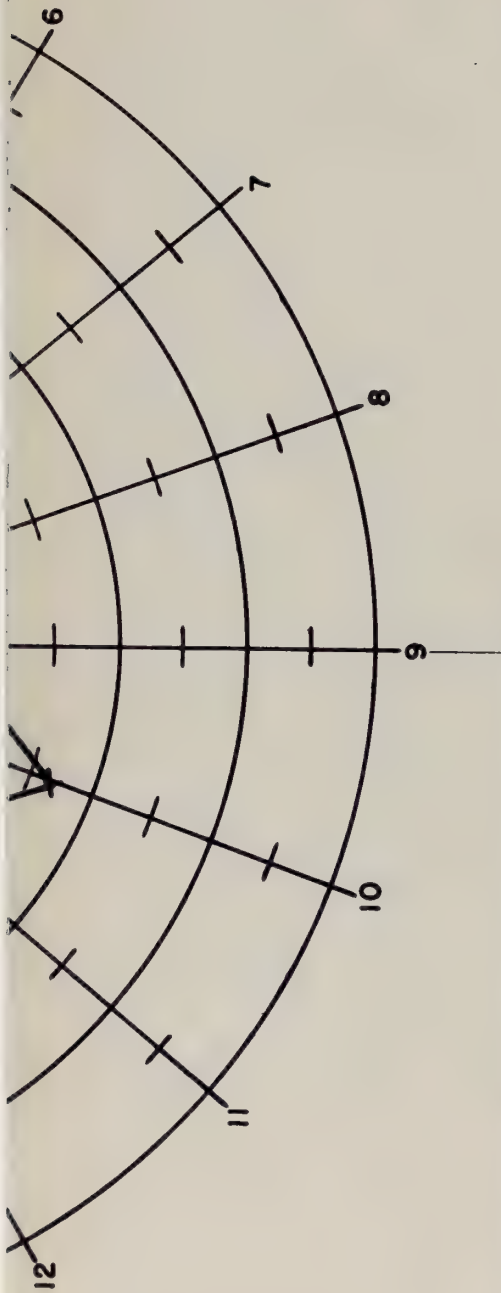
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

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RADIOORIENTATION PLOT

NO.2-SHORT STRING-11 SHOTS GUN NO.7 PERFORATIONS 1152-1162 ONE SHOT PER FOOT





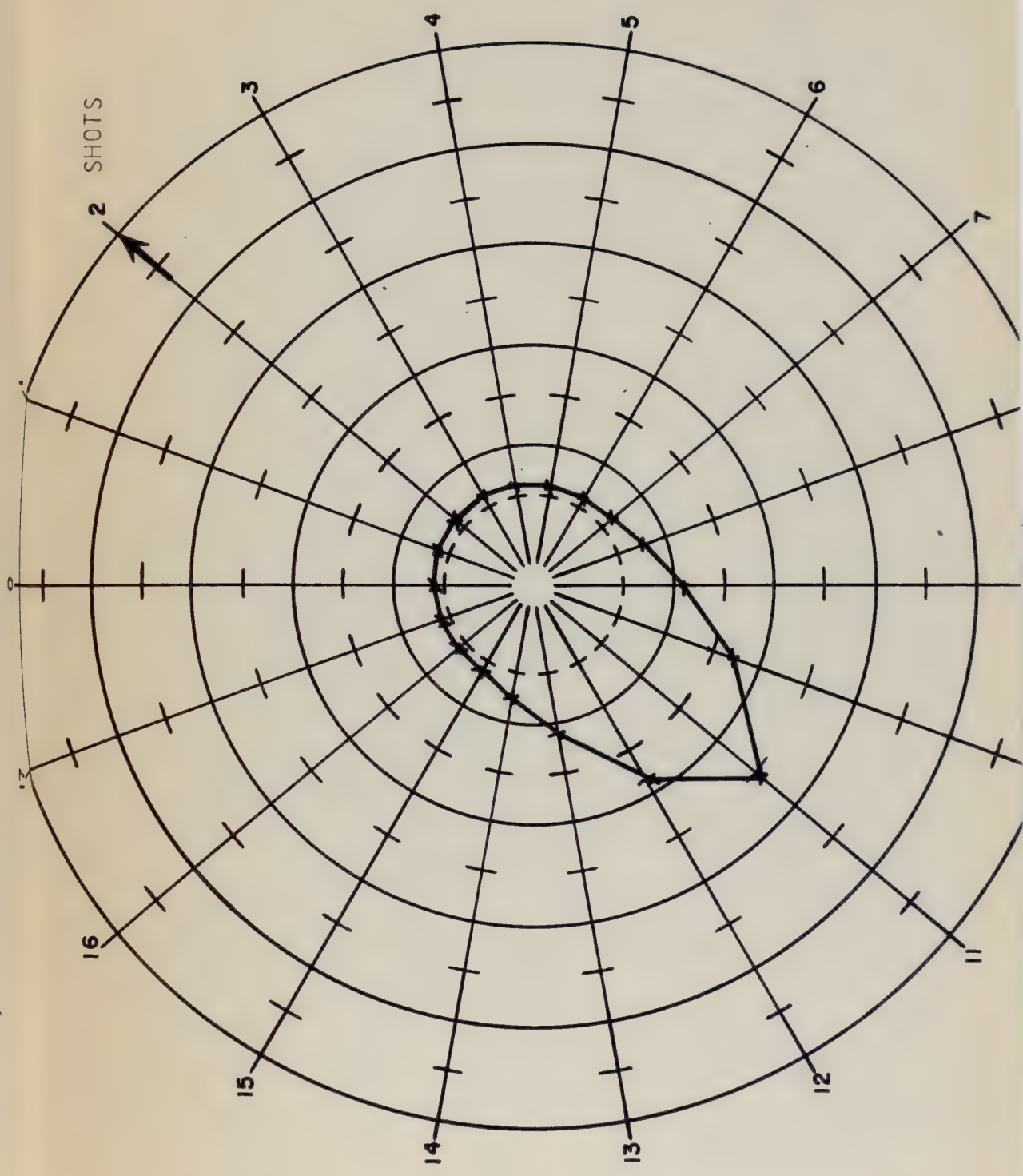
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

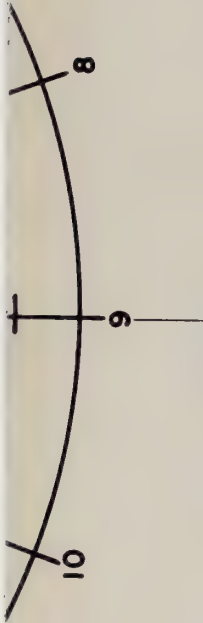
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO.2-SHORT STRING-11 SHOTS GUN NO. 8 PERFORATIONS 1141-1151 ONE SHOT PER FOOT





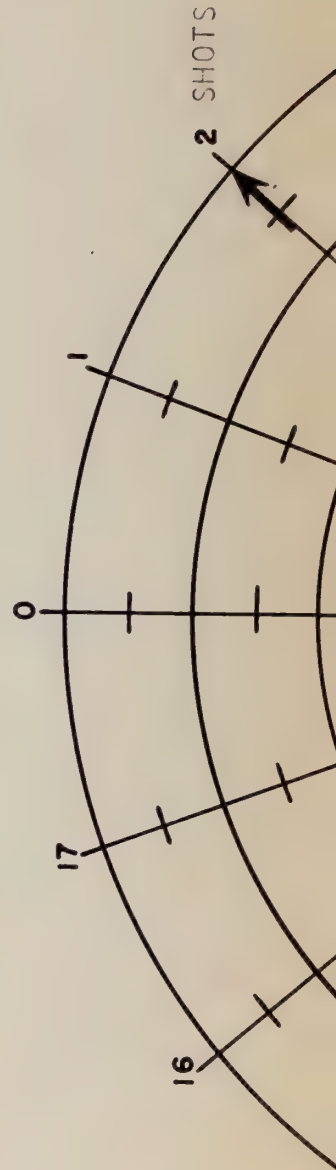
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

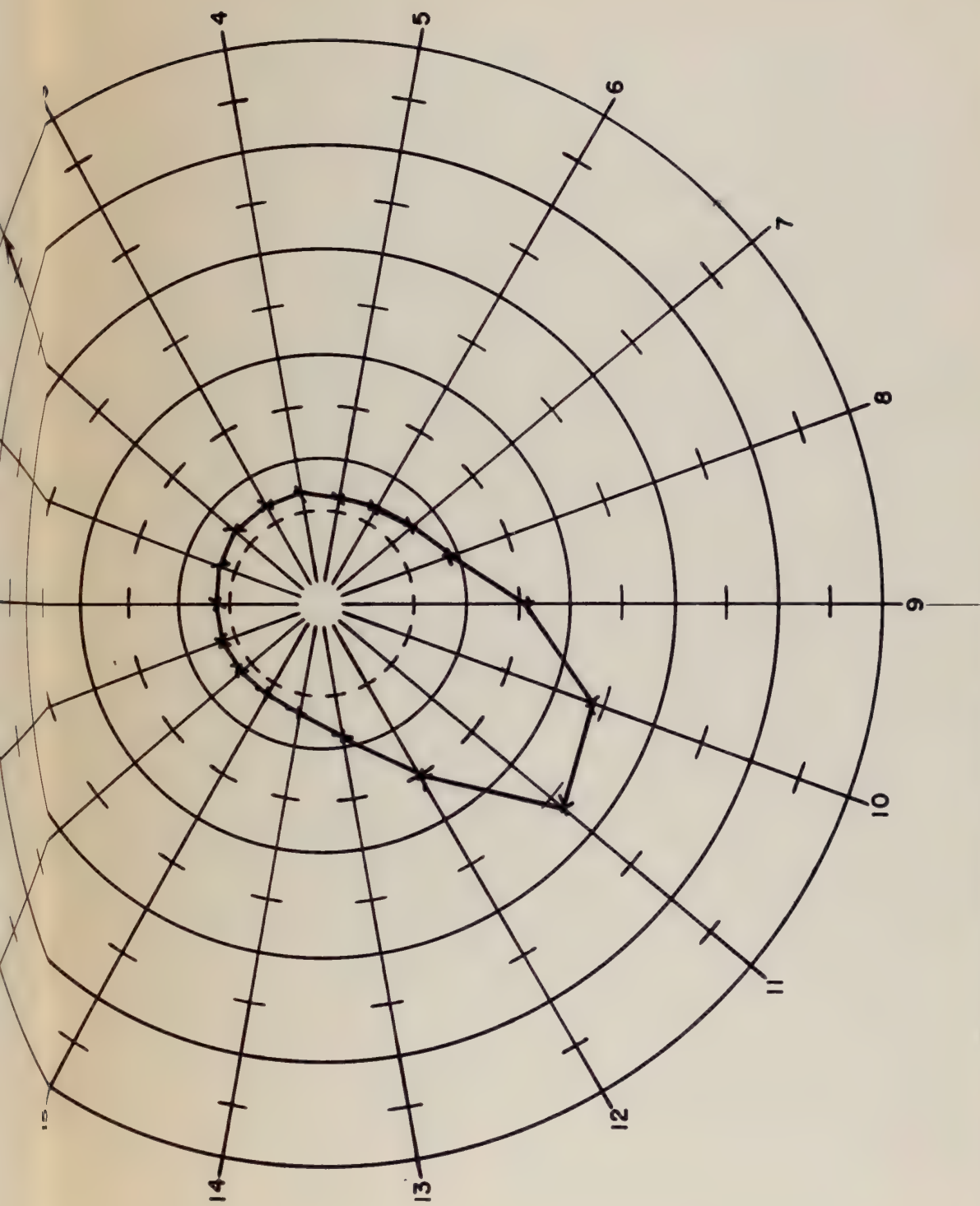
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO.2-SHORT STRING-11 SHOTS GUN NO.9 PERFORATIONS 1130-1140 ONE SHOT PER FOOT





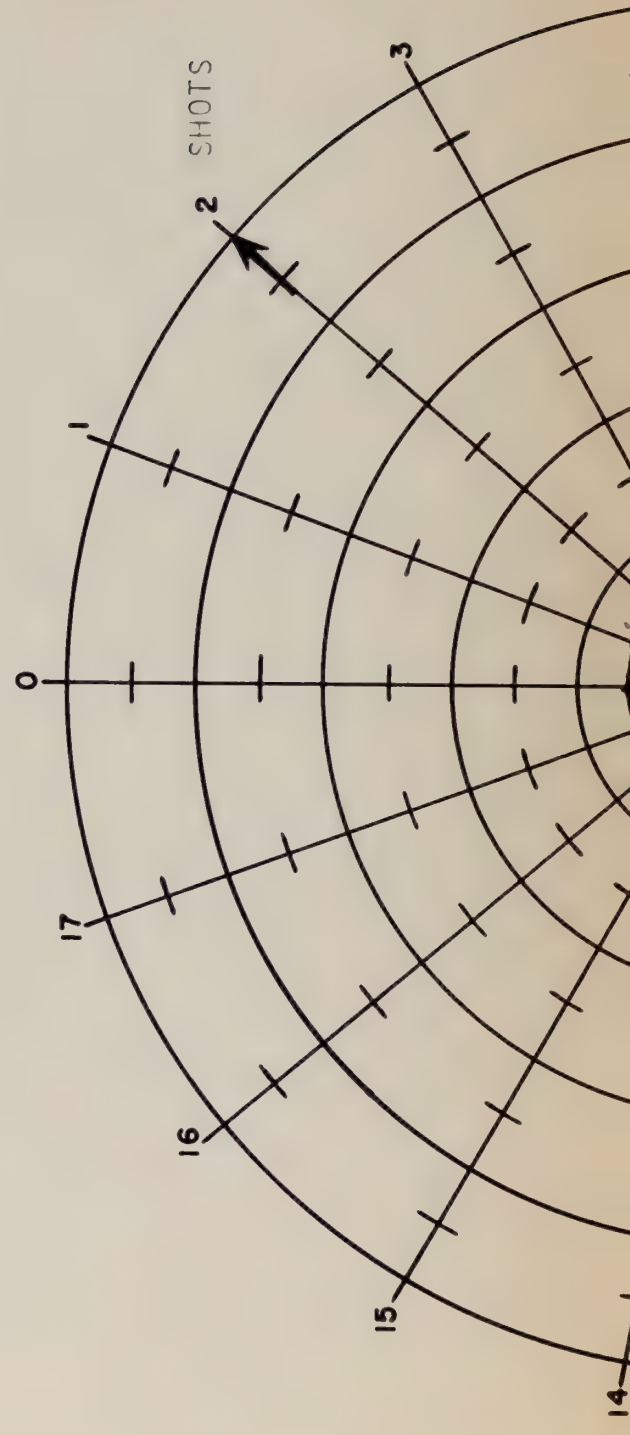
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by variant metal in the

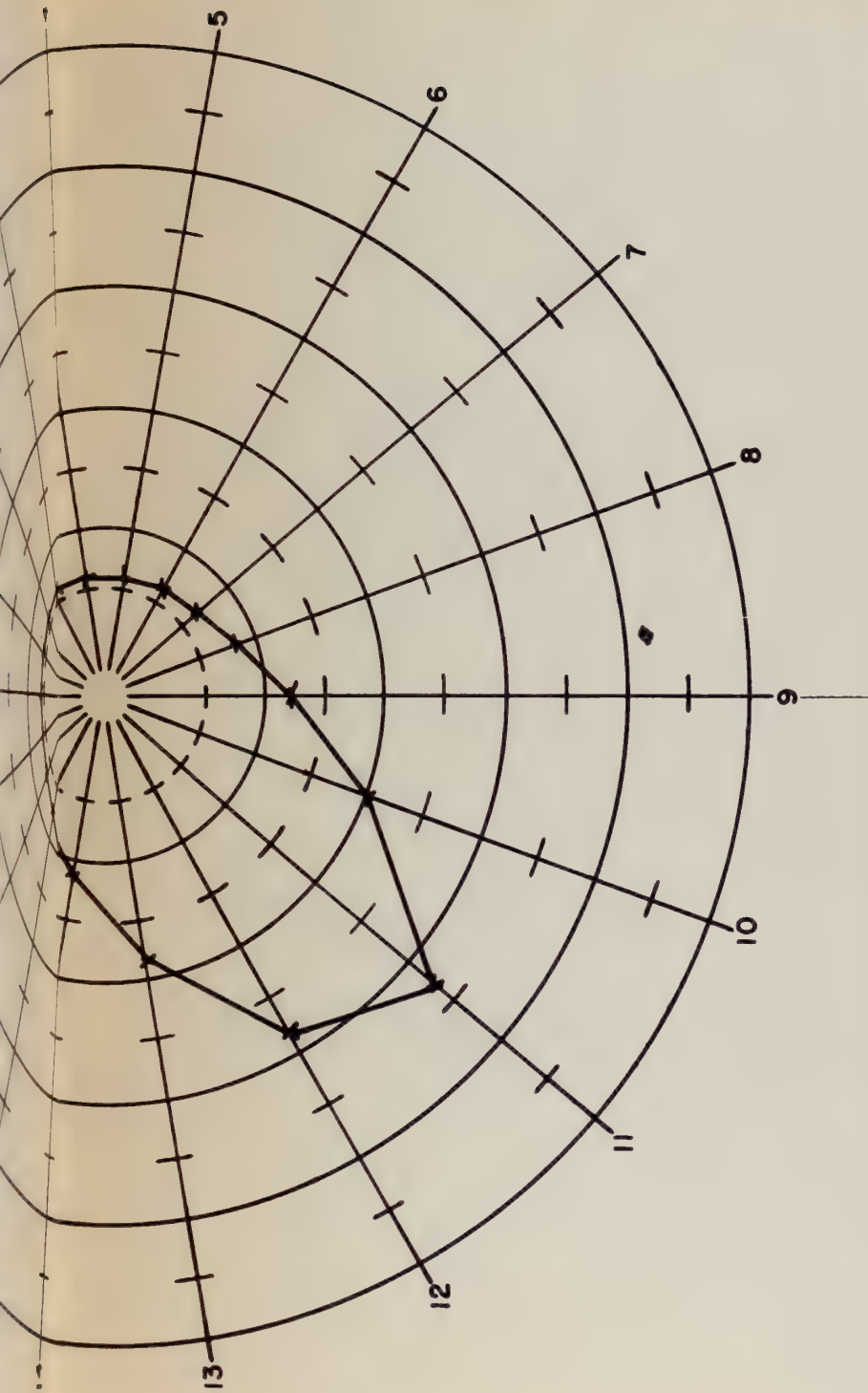
drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

NO.2-SHORT STRING-11 SHOTS GUN NO.10 PERFORATIONS 1119-1129 ONE SHOT PER FOOT





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

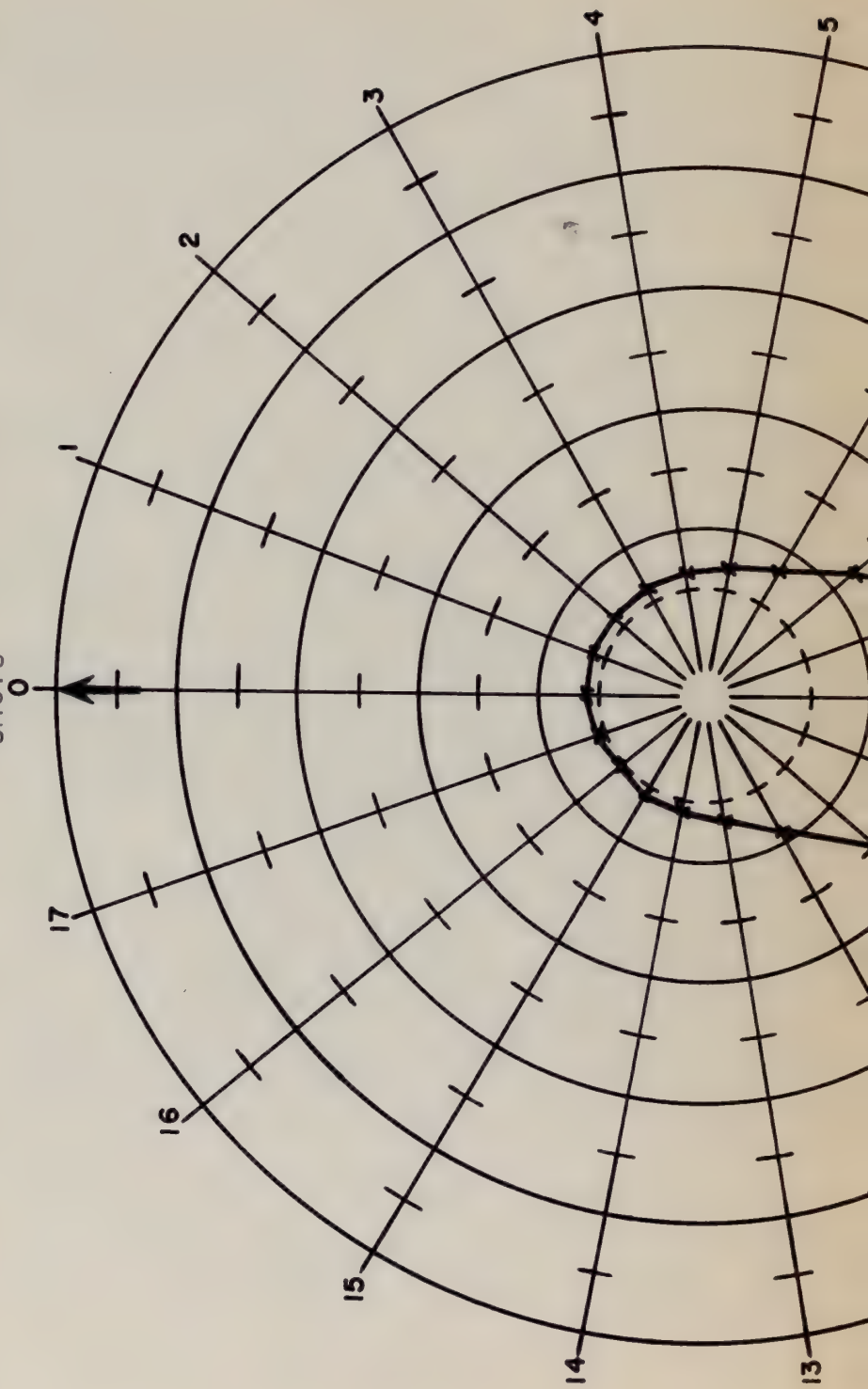
Schlumberger

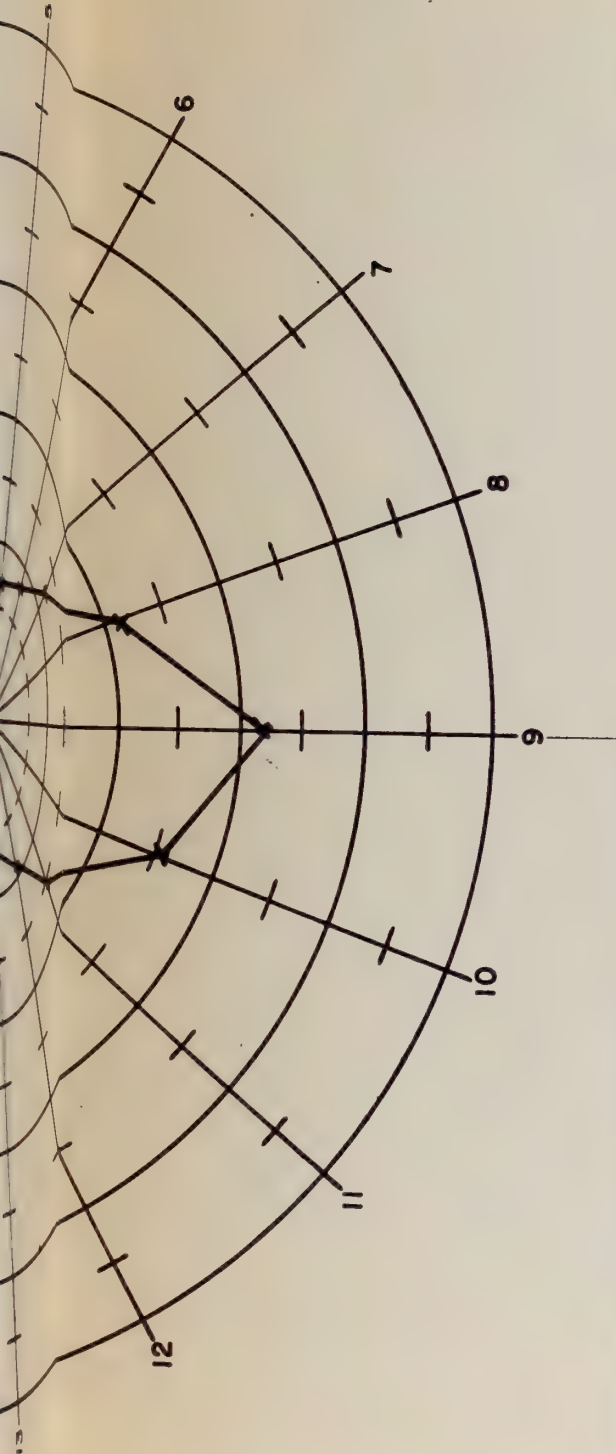
RADIOORIENTATION PLOT

POT-B

NO.2-SHORT STRING-11 SHOTS GUN NO. 11 PERFORATIONS 1108-1118 ONE SHOT PER FOOT

SHOTS





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

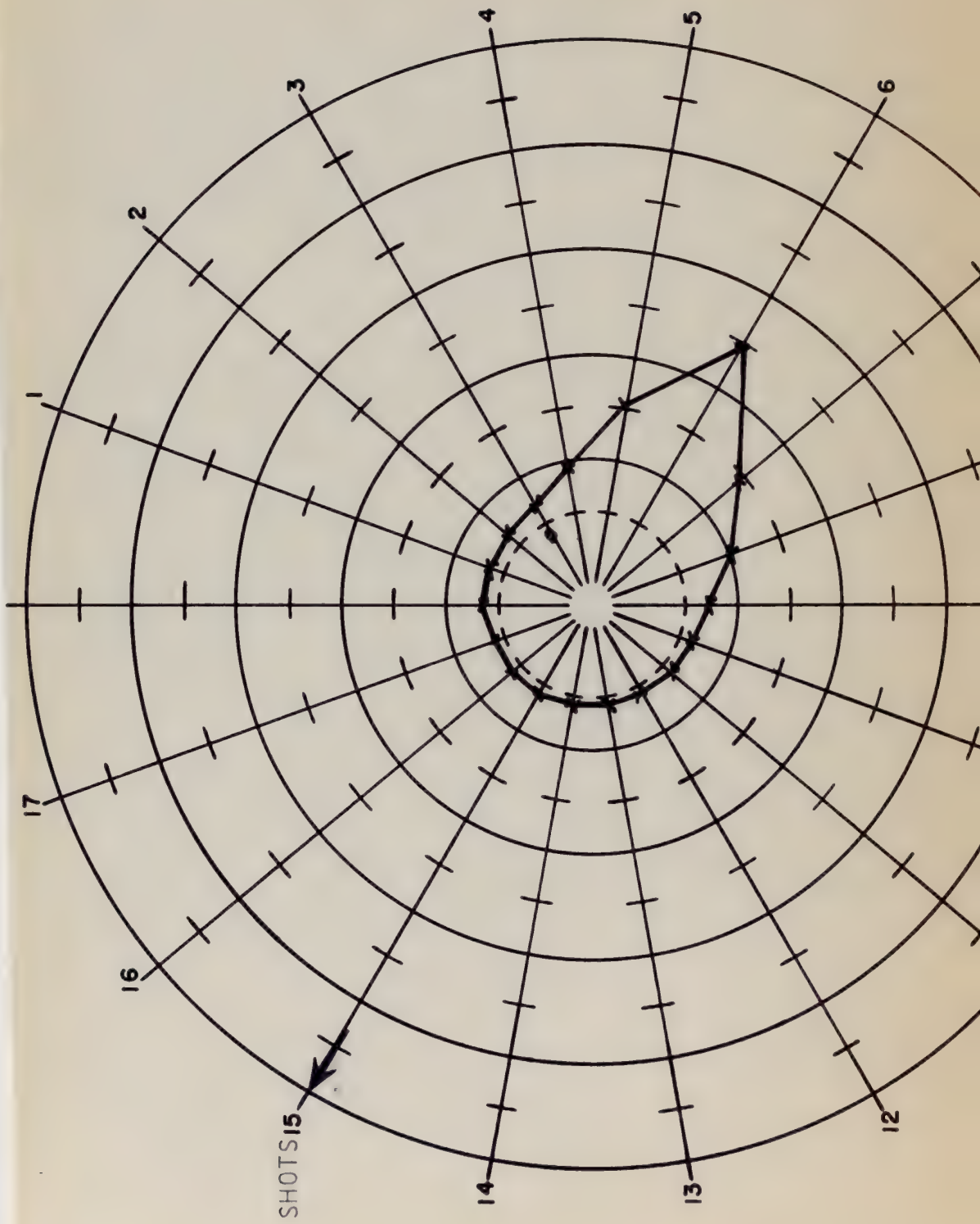
Schlumberger

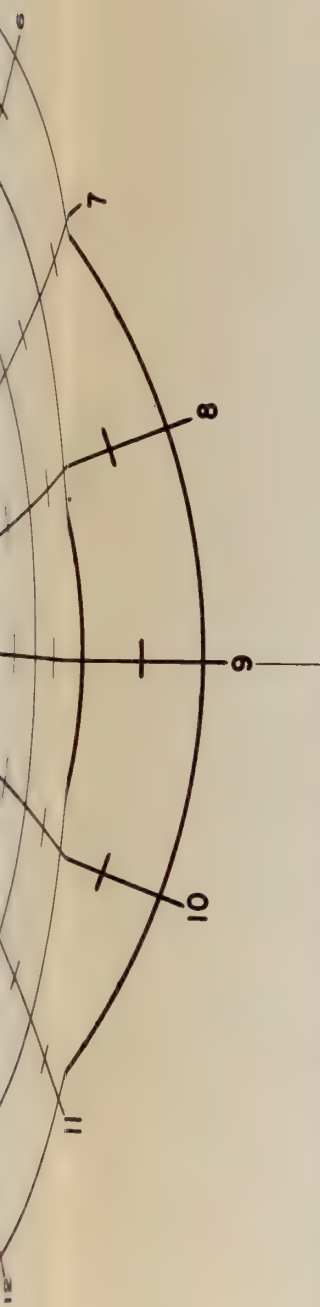
RADIOORIENTATION PLOT

POT-B

NO.2-SHORT STRING--11 SHOTS GUN NO.12 PERFORATIONS 1097-1107 ONE SHOT PER FOOT

0





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

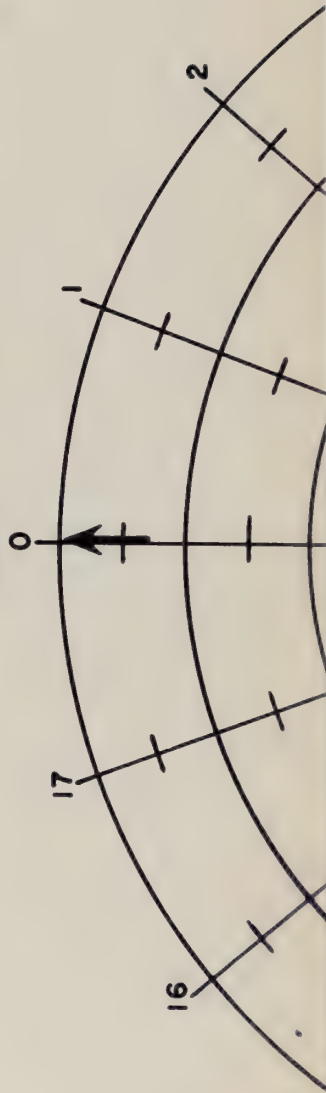
Schlumberger

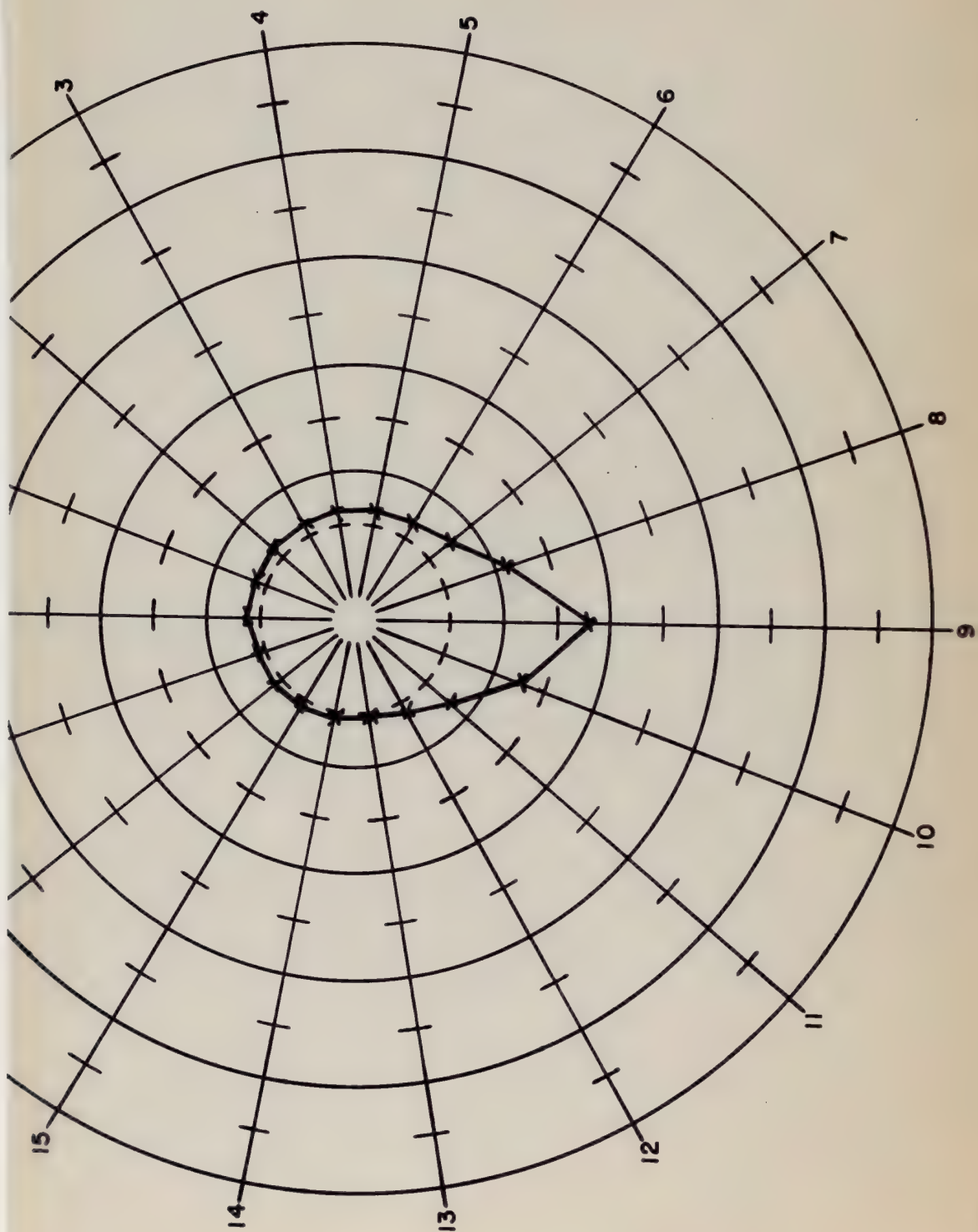
RADIO-ORIENTATION PLOT

POT-B

NO. 2-SHORT STRING-9 SHOTS GUN NO. 13 PERFORATIONS 1088-1096 ONE SHOT PER FOOT

SHOTS

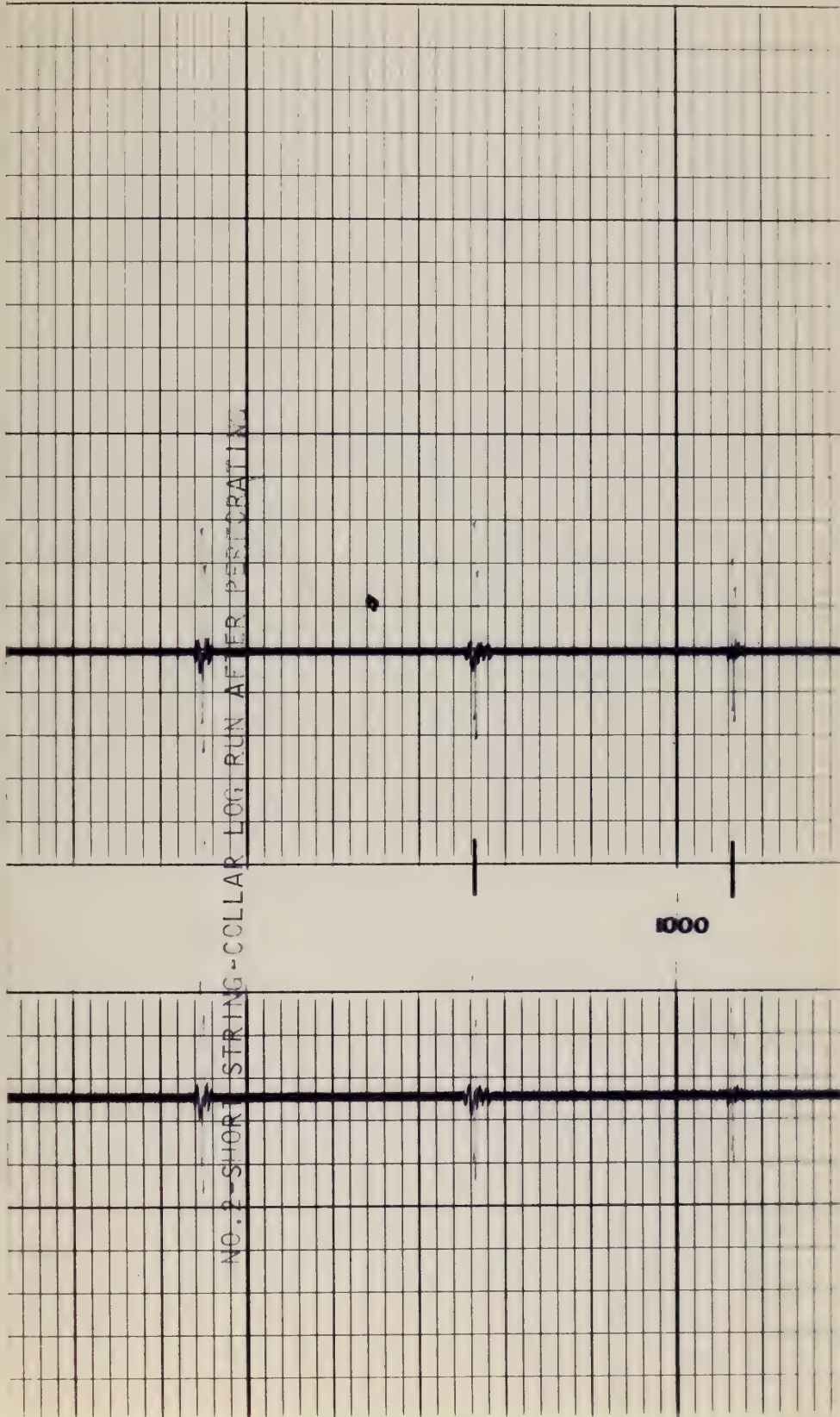


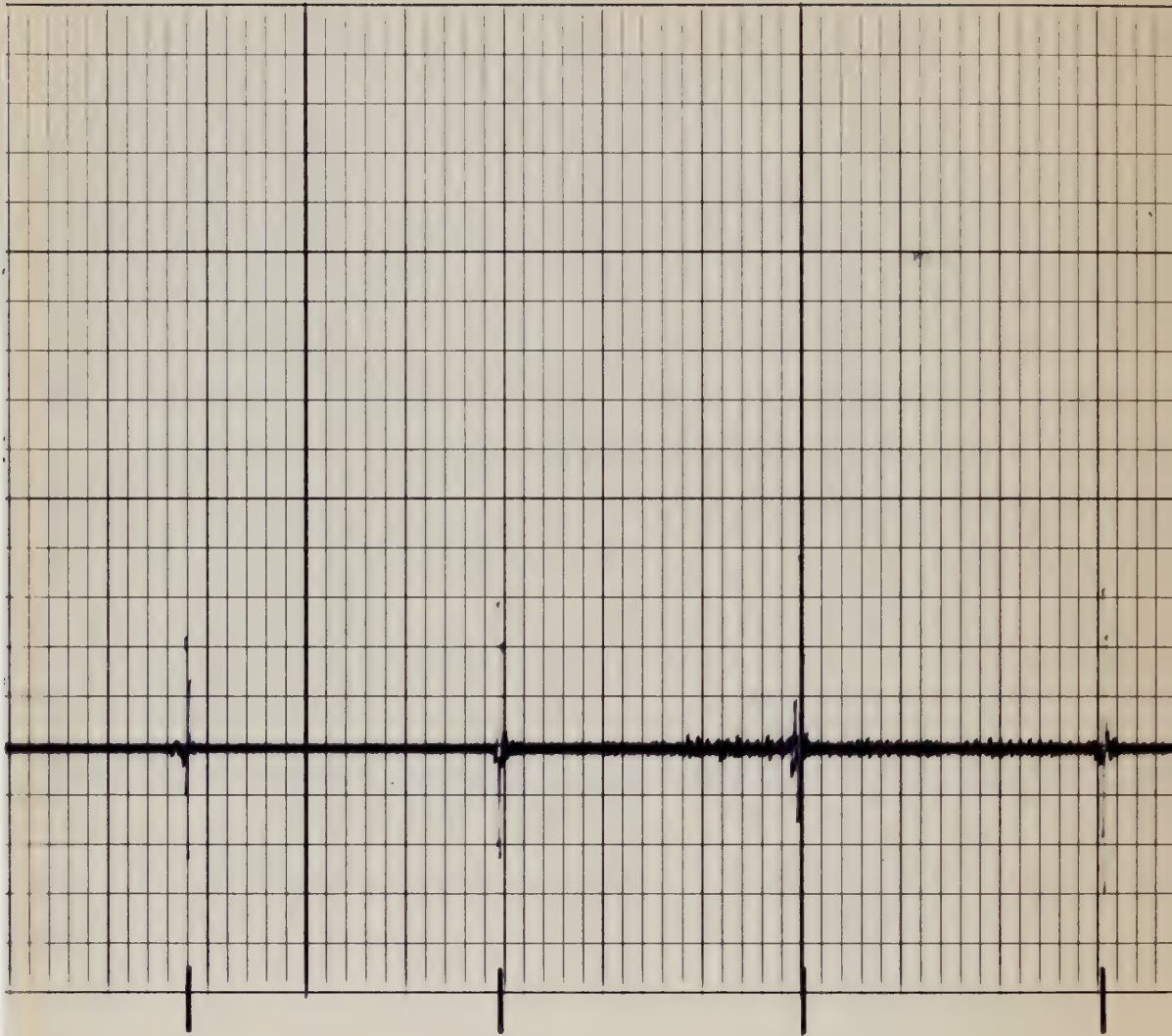


These readings are for use only in connection with the log run after penetrating the hole. They are not to be used for any other purpose. The readings are subject to the General Terms and Conditions of our Service Order for this job. The readings could be adversely affected by rapid rotation in the drill hole and other conditions unknown to us.

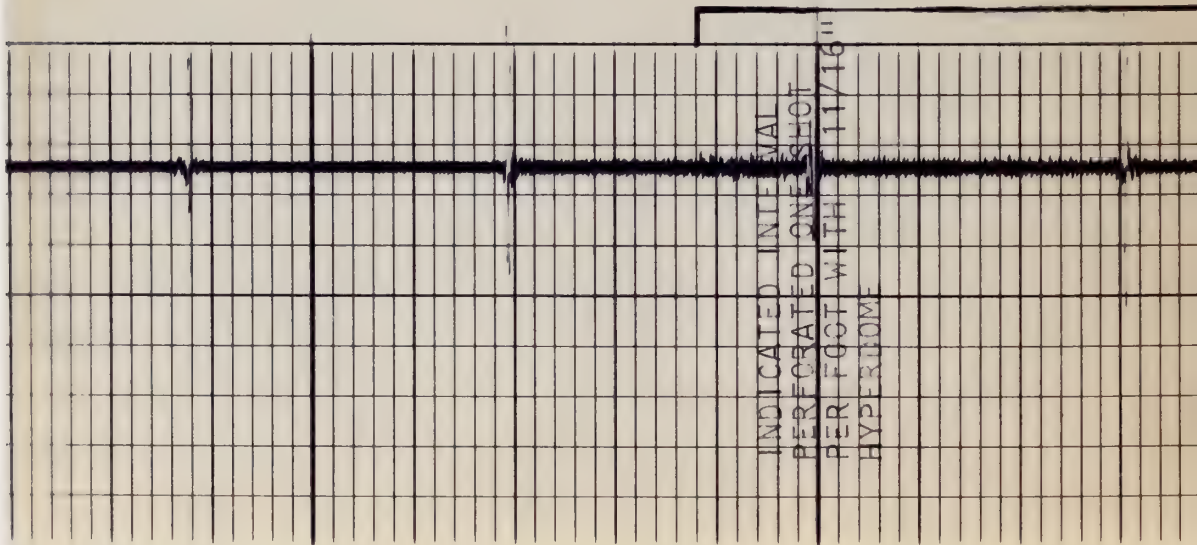
Schlumberger

NO. 2 - SHORT STRING - COLLAR LOG RUN AFTER PENETRATING

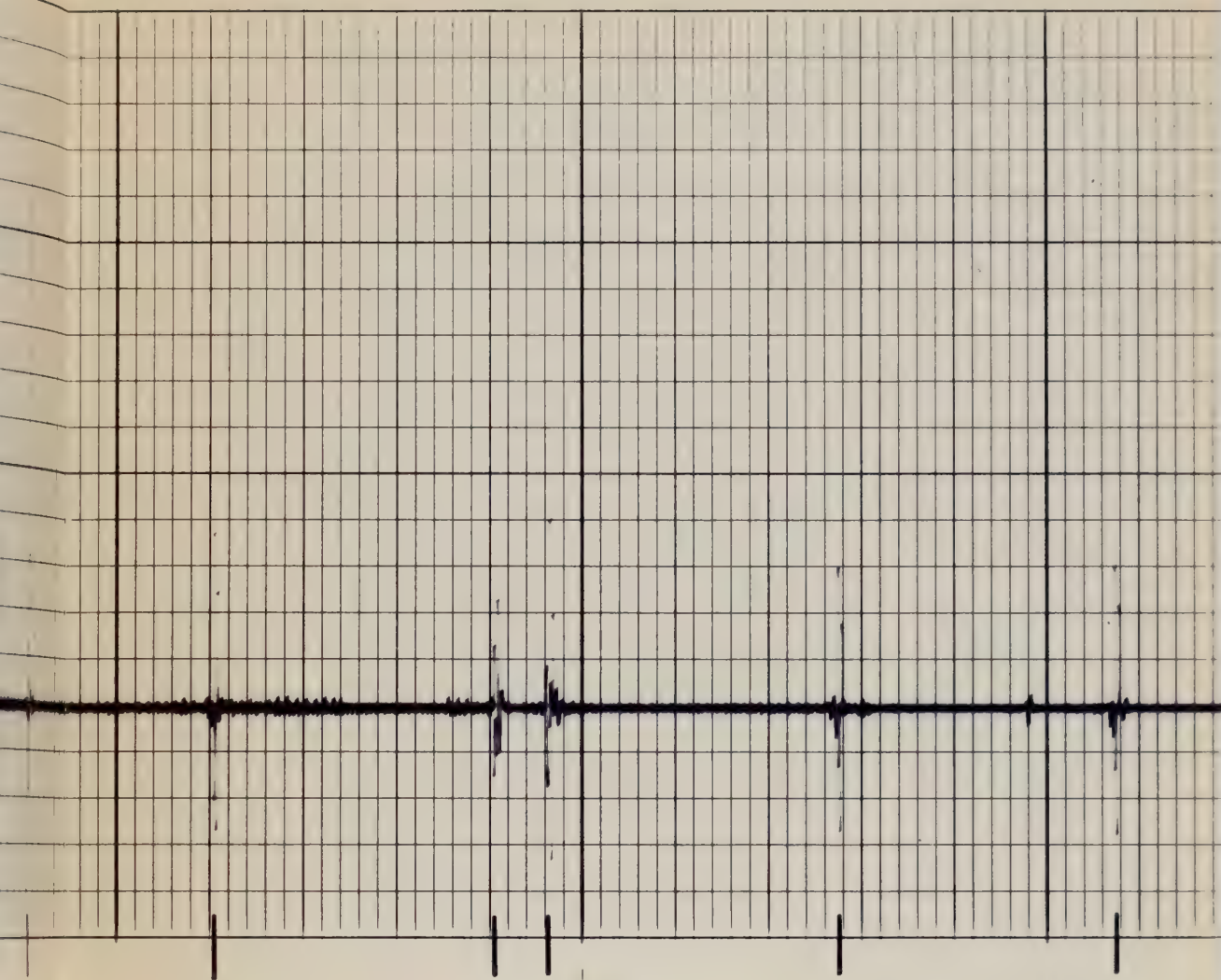




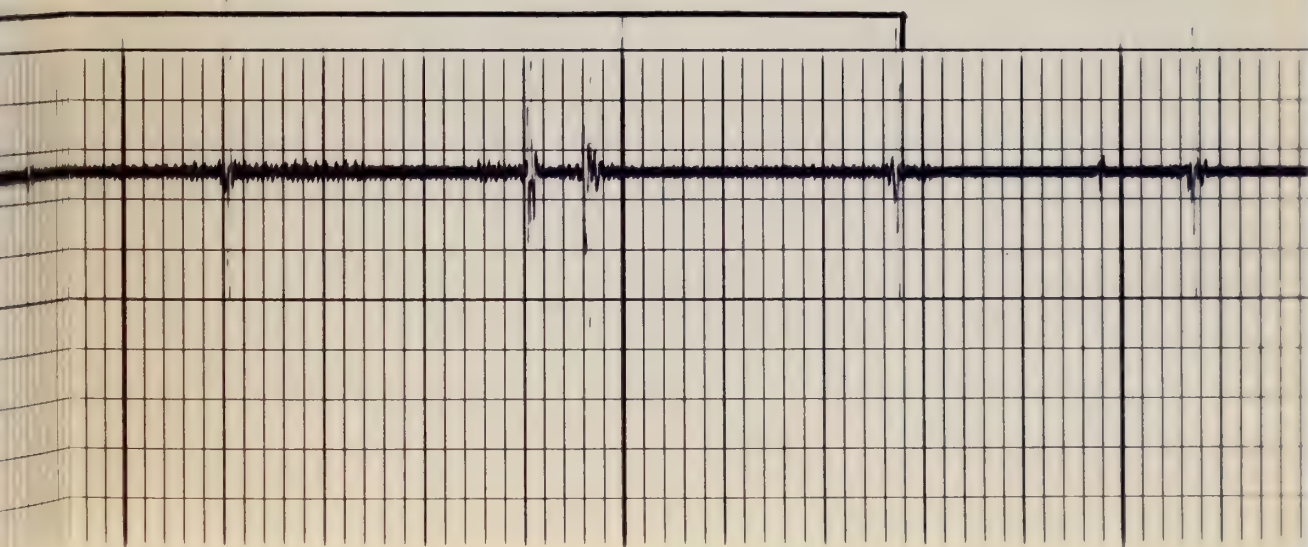
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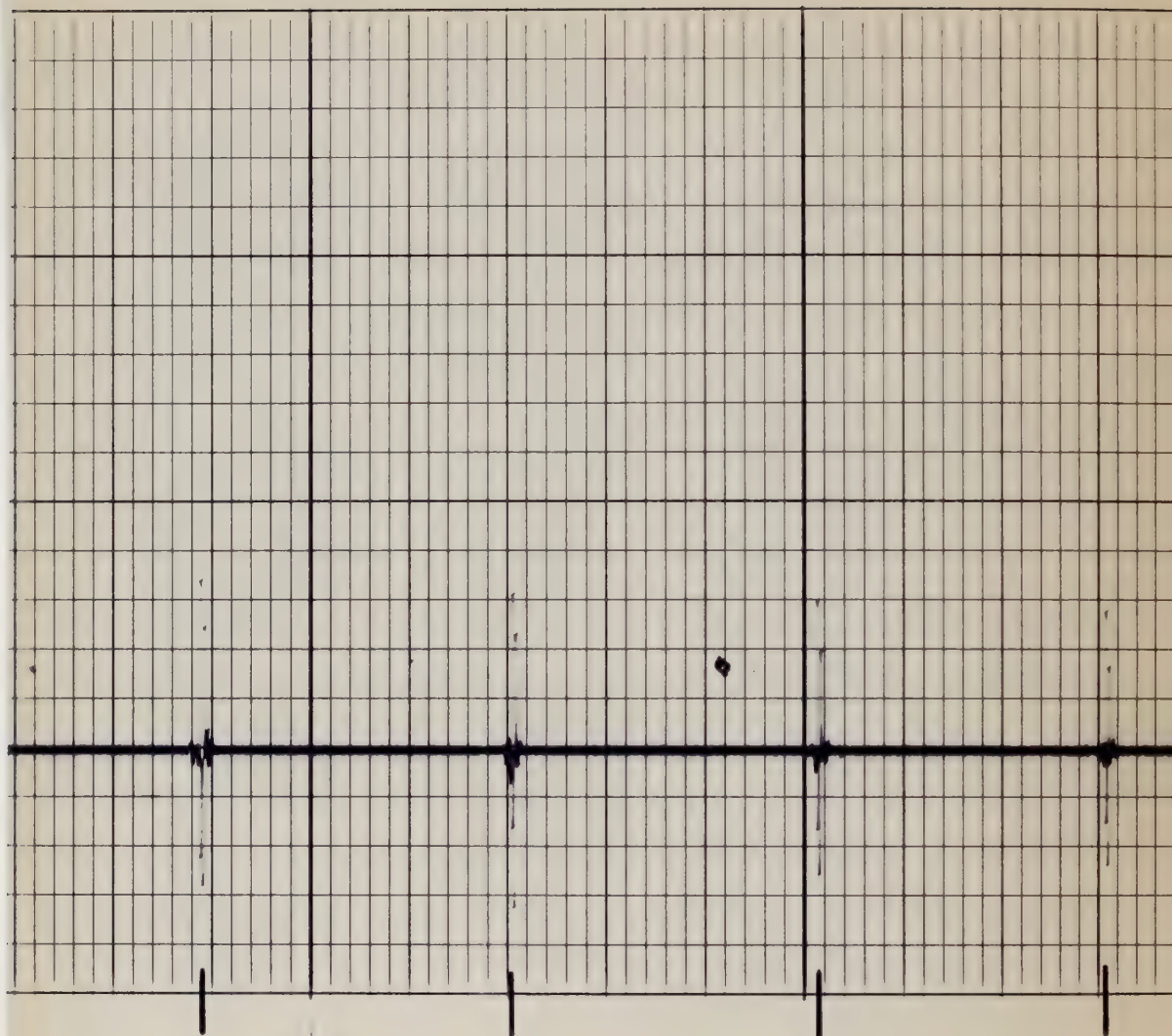


INDICATED INTERNAL
PERFORATED ONE SHOT
PER FOOT WITH 11/16"
HYPERDOME

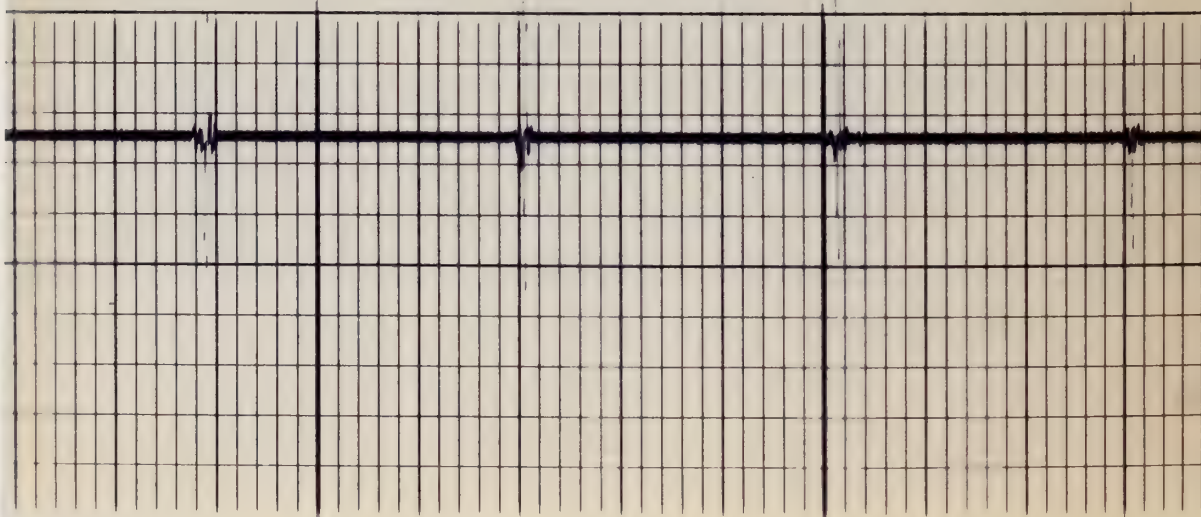


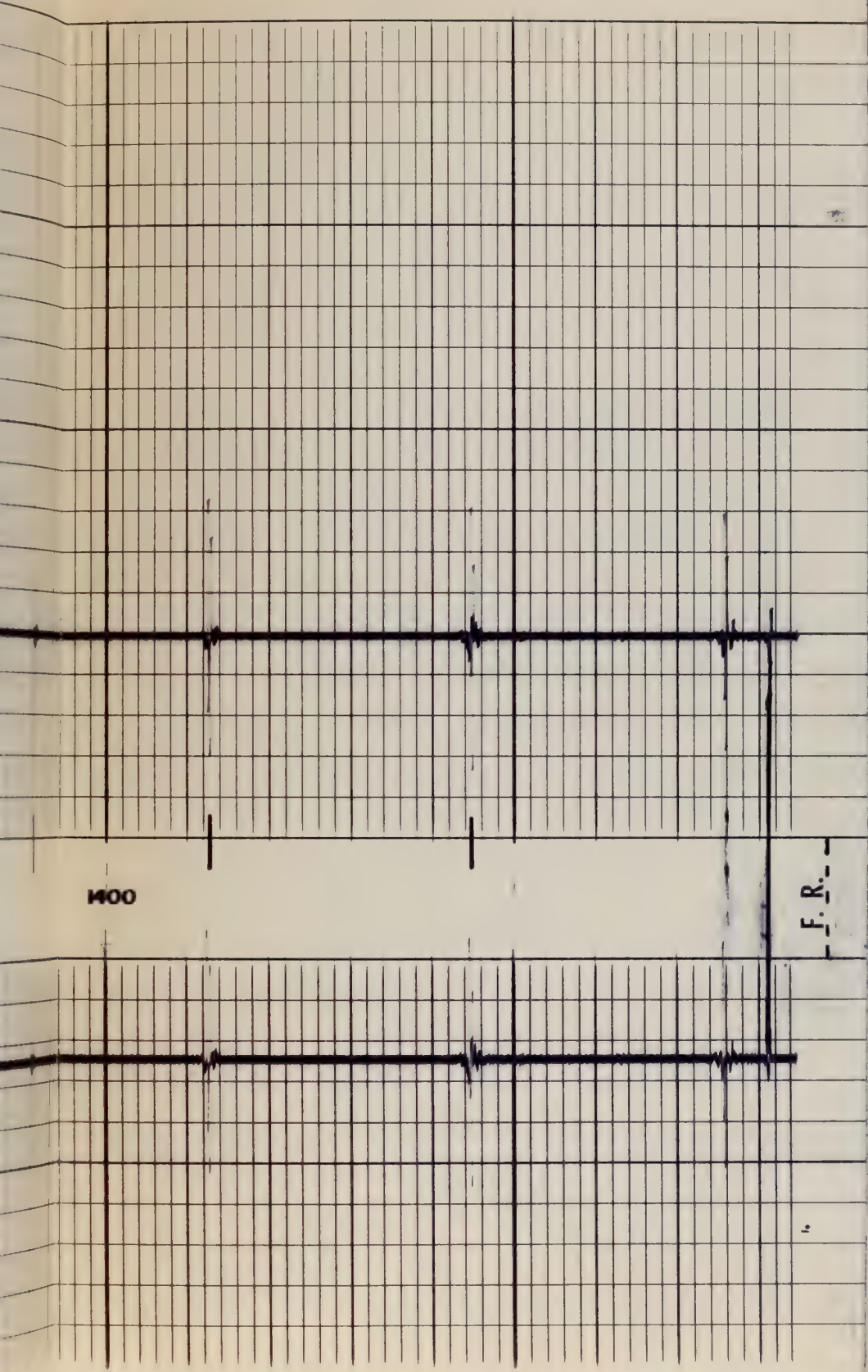
200





300





COMPANY ATLANTIC RICHFIELD COMPANY

WELL S.G. NO. 17

FIELD SORGHUM GULCH

Schlumberger

____ RIO BLANCO, COLORADO _____

SWS-1425.B

Schlumberger**PERFORATING DEPTH CONTROL**

COUNTY <u>RIO BLANCO</u> FIELD or LOCATION <u>SORGHUM GULCH</u> WELL <u>S.G. NO. 17</u> COMPANY <u>ATLANTIC RICHFIELD</u> COMPANY	COMPANY <u>ATLANTIC RICHFIELD COMPANY</u>	
	WELL <u>S.G. NO. 17</u>	
	FIELD <u>SORGHUM GULCH</u>	
	COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u>	
Location <u>436' FWL & 181 FSL</u>		Other Services: <u>CBL-VDL</u> <u>ORP-HD</u>
Sec. <u>16</u> Twp. <u>3S</u> Rge. <u>46W</u>		
Permanent Datum: <u>GROUND LEVEL</u> ; Elev.: <u>7036</u>		Elev.: K.B. <u>----</u>
Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum		D.F. <u>----</u>
Drilling Measured From <u>GL</u>		G.L. <u>7036</u>
Date	<u>2-15-75</u>	
Run No.	<u>ONE</u>	
Type Log	<u>GAMMA RAY</u>	
Depth — Driller	<u>2305-1490</u>	
Depth — Logger	<u>2285-1503</u>	
Bottom logged interval	<u>2277-1495</u>	
Top logged interval	<u>900- 800</u>	
Type fluid in hole	<u>WATER</u>	
Salinity, PPM Cl.	<u>----</u>	
Density	<u>----</u>	
Level	<u>FULL</u>	
Max. rec. temp., deg F.	<u>----</u>	
Operating rig time	<u>THREE HOURS</u>	
Recorded By	<u>ST. AUBYN</u>	
Witnessed By	<u>MR. DON TAIT</u>	
BORE-HOLE RECORD		
Bit Size	From	To
<u>5 3/4</u>	<u>56</u>	<u>2460</u>
CASING RECORD		
Size	Wgt.	From
<u>8 5/8</u>	<u>24</u>	<u>SURF</u>
<u>2 3/8</u>	<u>4.7</u>	<u>SURF</u>
<u>2 3/8</u>	<u>4.7</u>	<u>SURF</u>

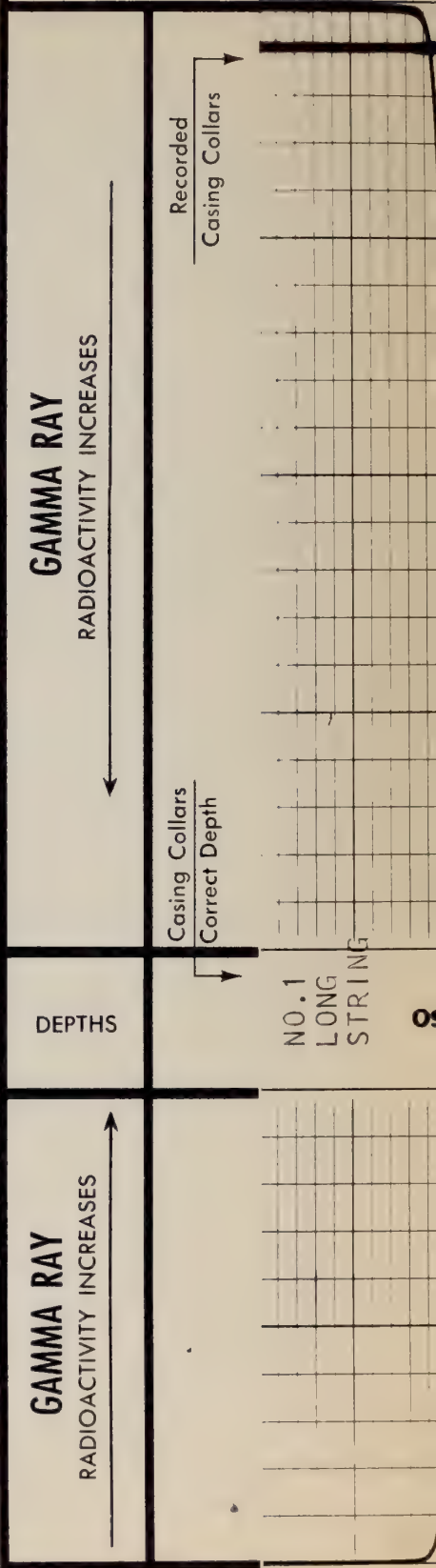
FOLD HERE

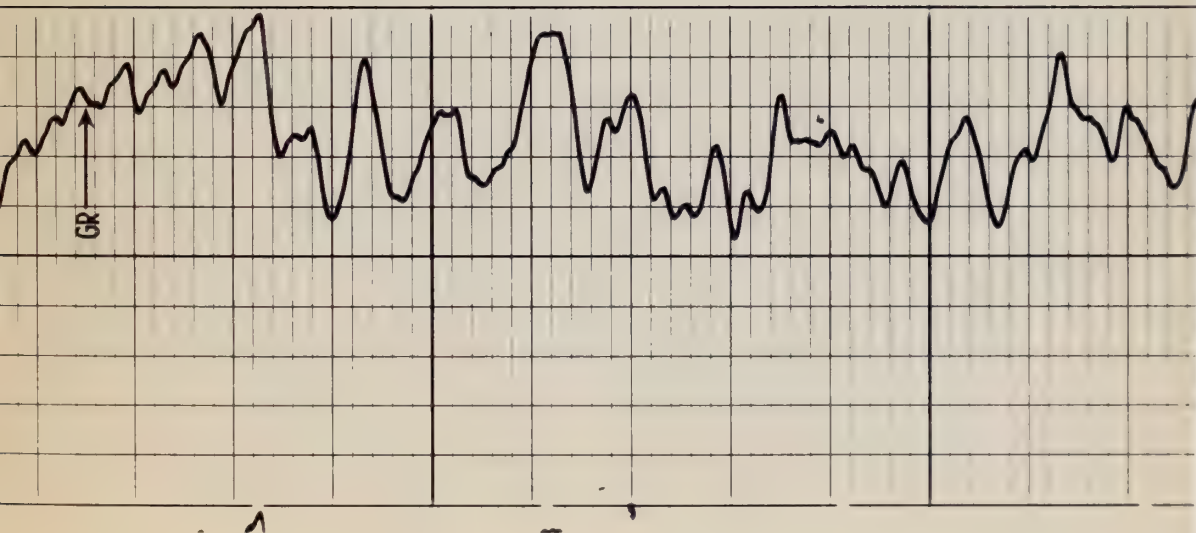
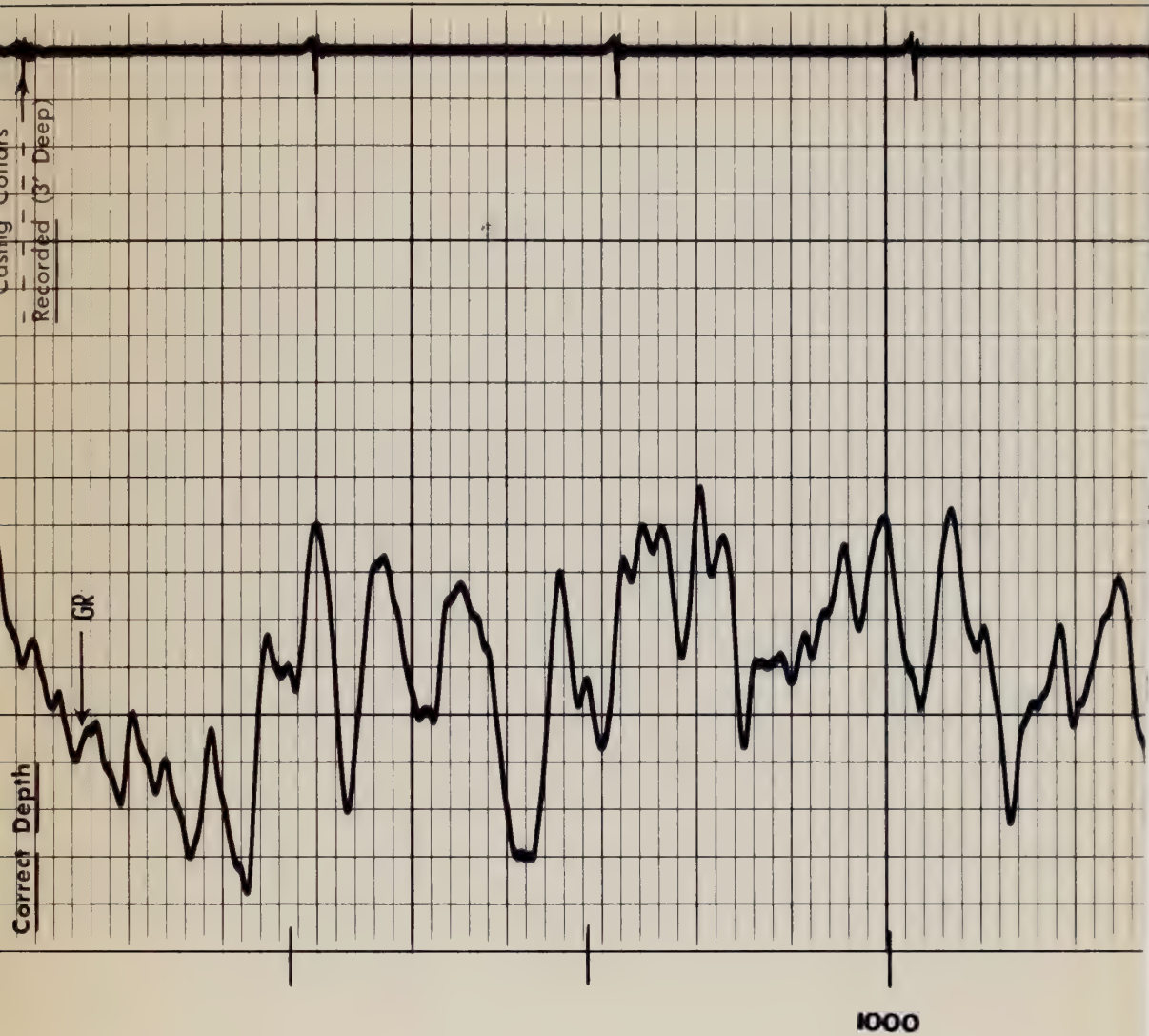
The well name, location and borehole reference data were furnished by the customer.

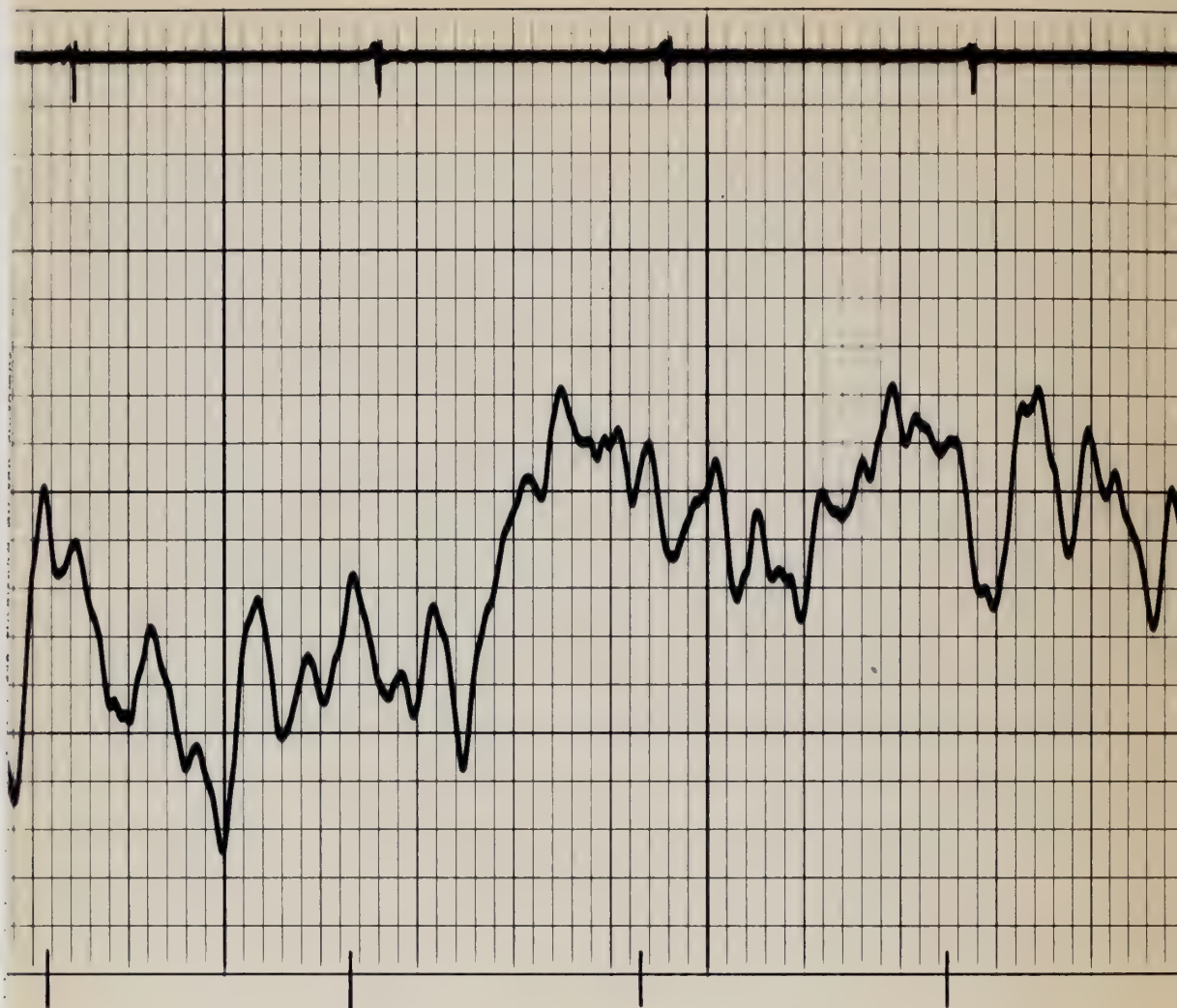
EQUIPMENT DATA

Gamma Ray

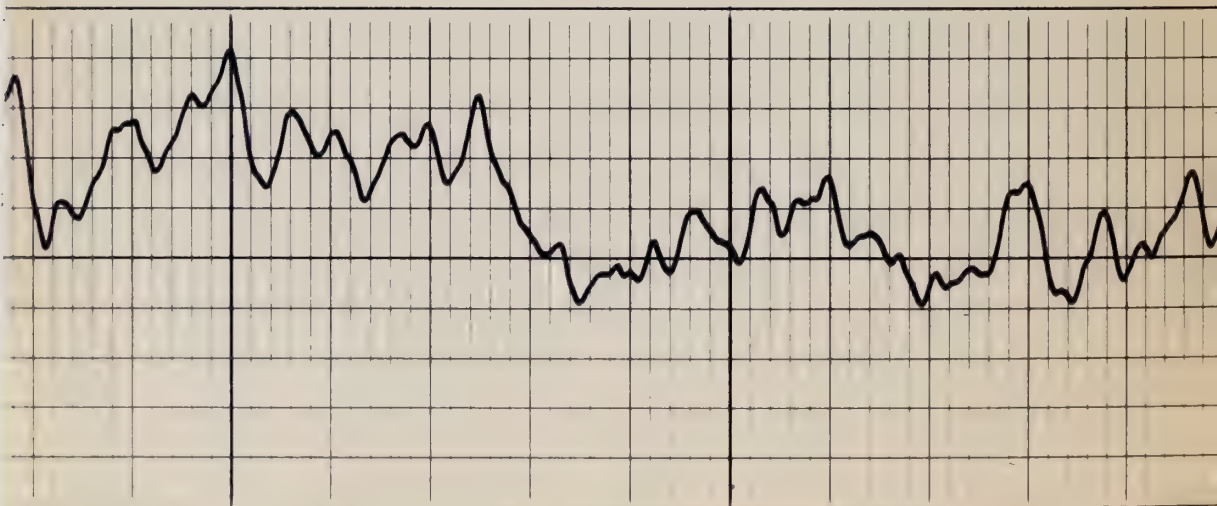
Run No.	ONE
Tool Model No.	GNT-K
Diameter	1 11/16"
Def'r Model No.	SGD-H
Type	SCINT
Length	8"
S. O. No.	
General	
Hoist Truck No.	3862
Inst. Truck No.	3862
Tool Serial No.	291
Location	VERNAL
Remarks:	Casing Collars recorded 3 ft. DEEP. Corrected collar depths are shown in the depth track.

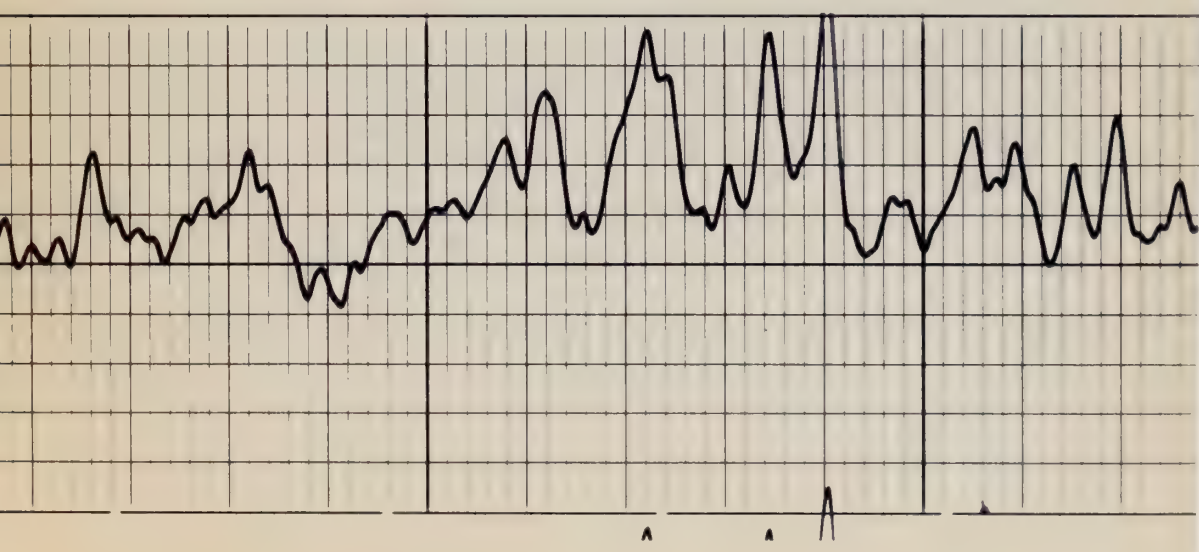
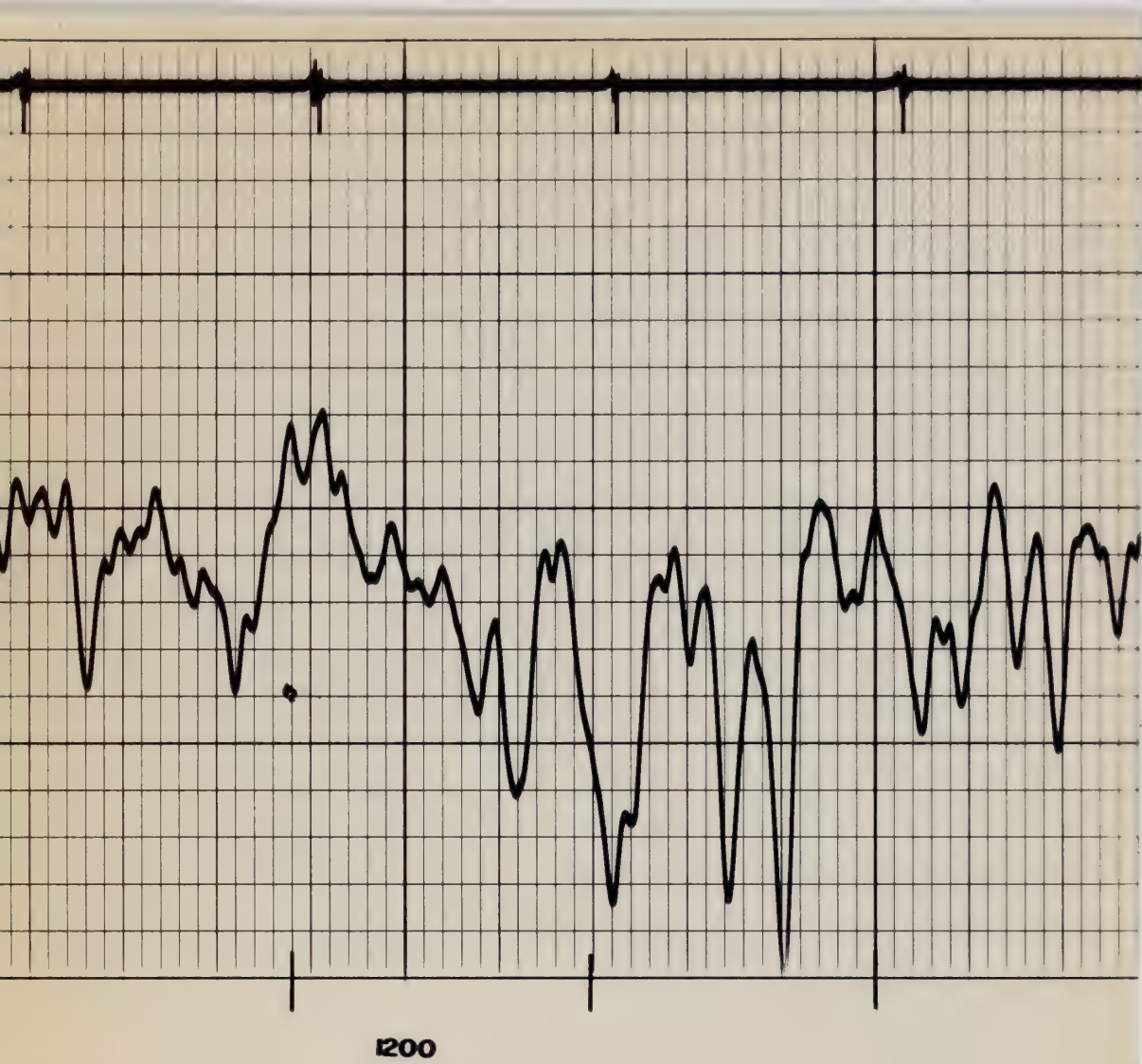


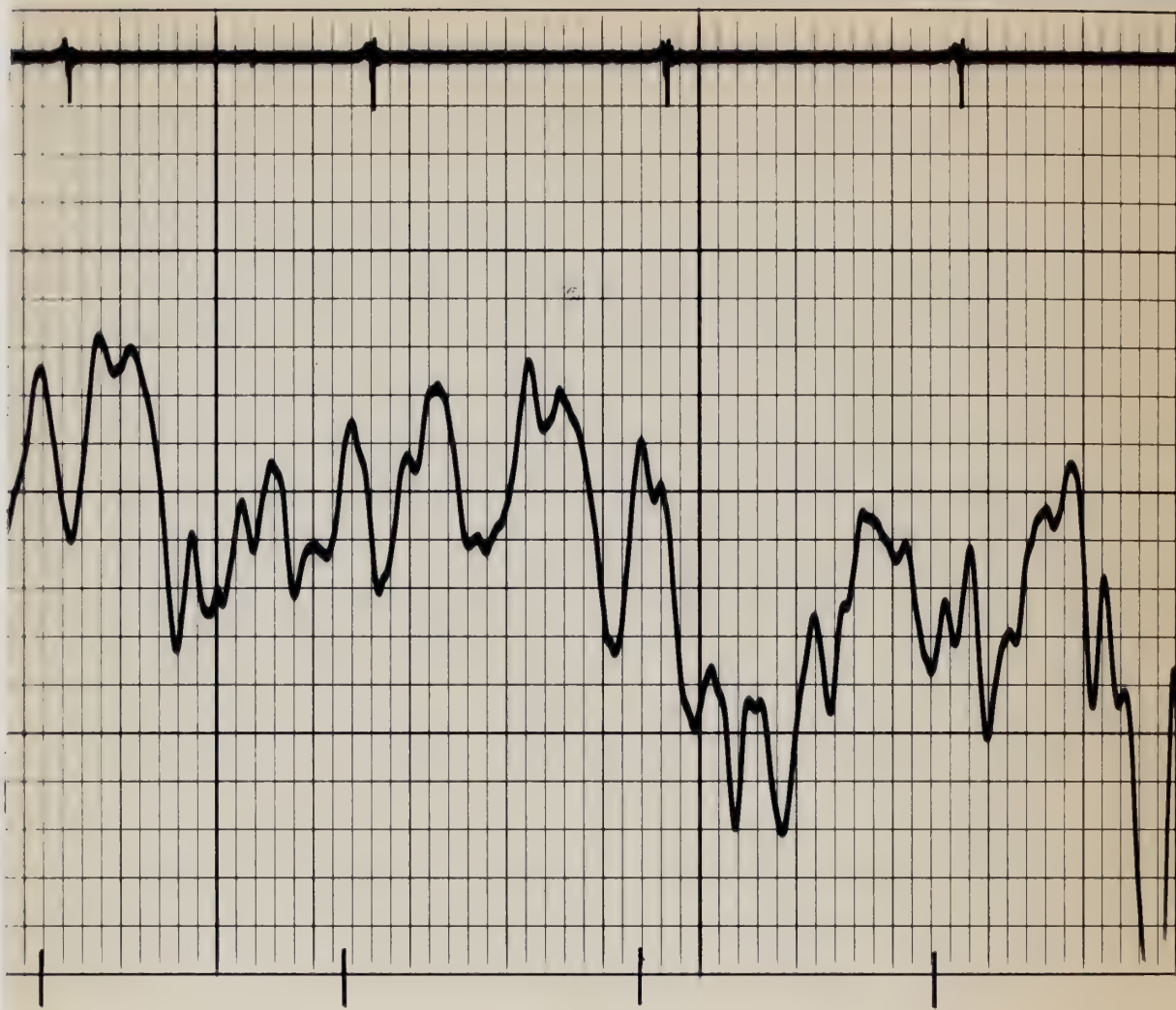




NOO

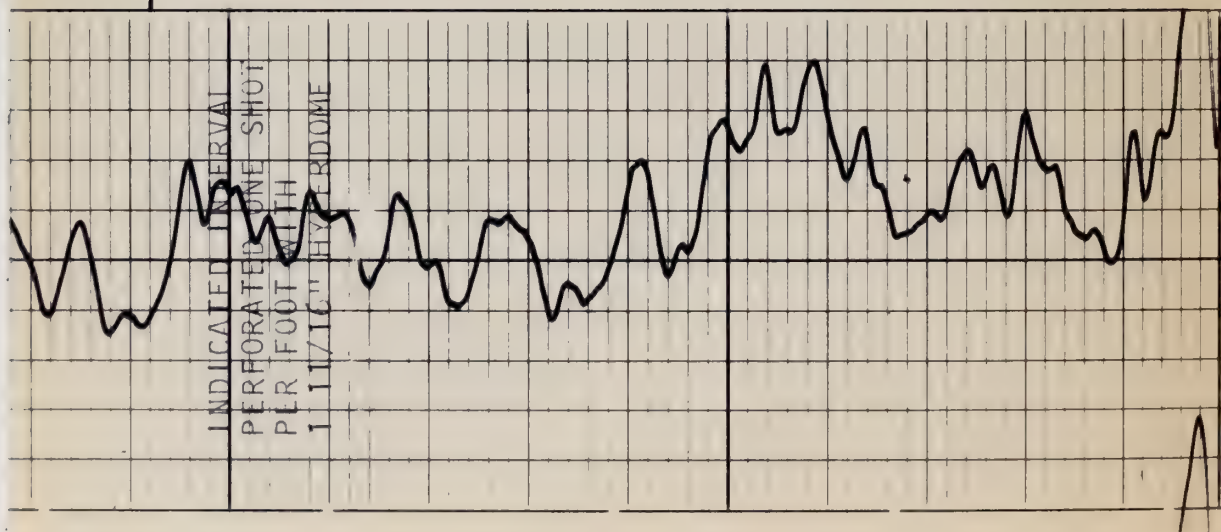


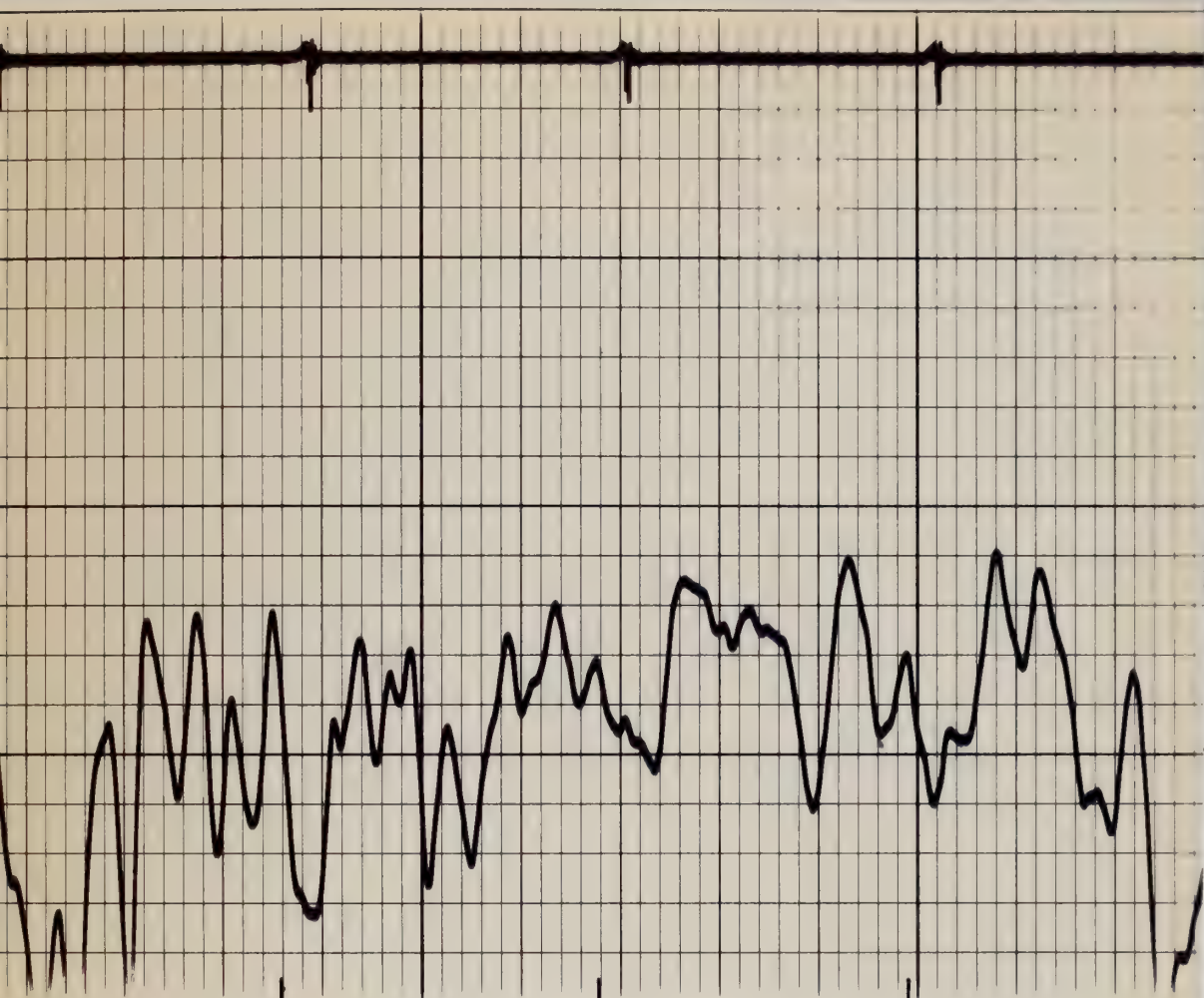




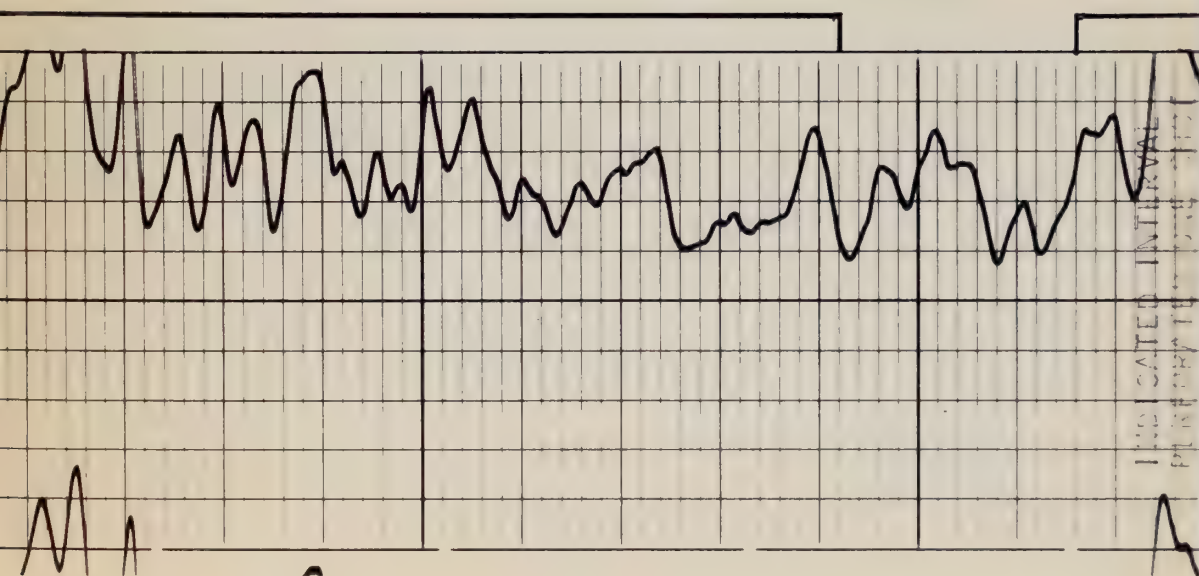
300

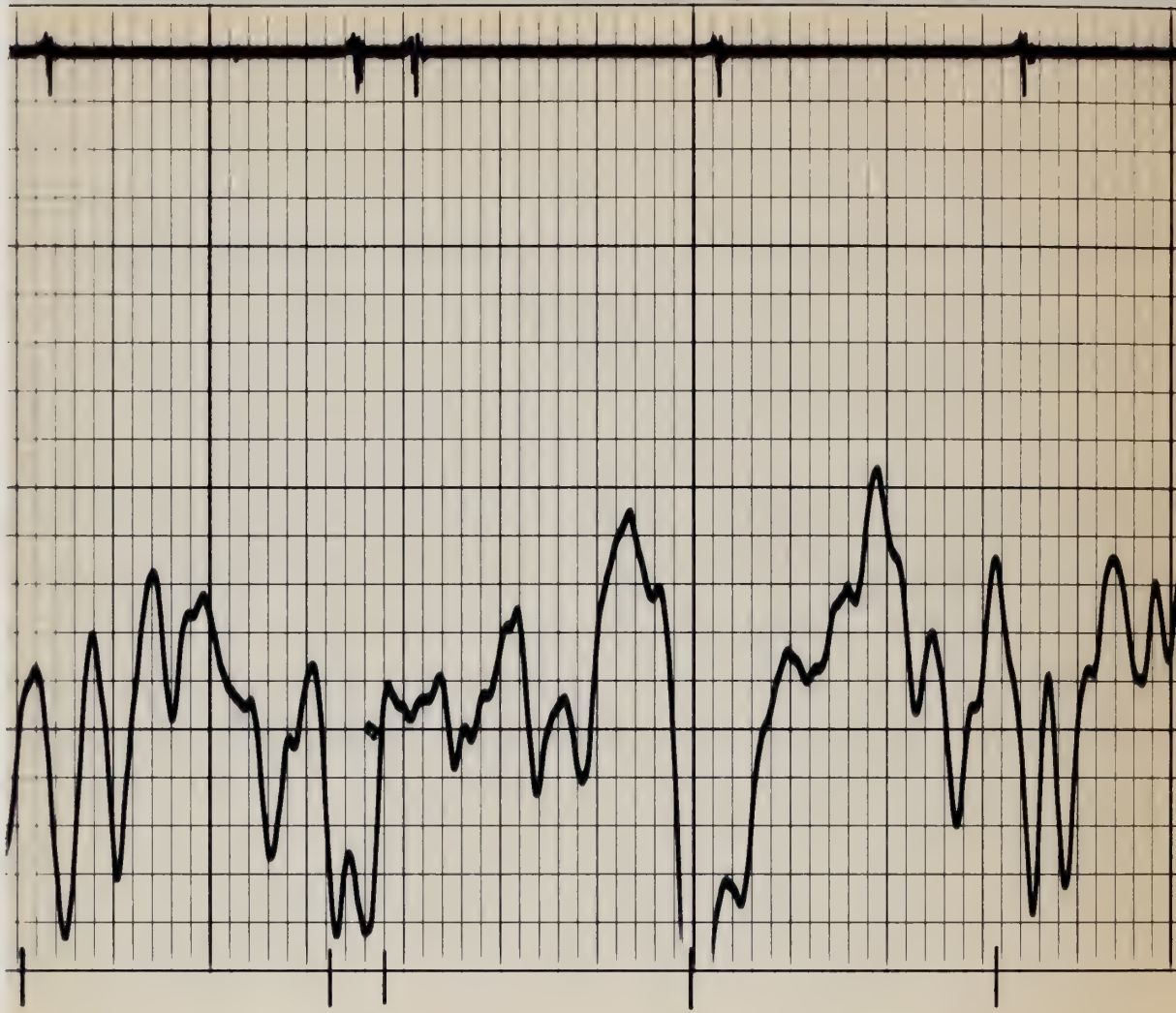
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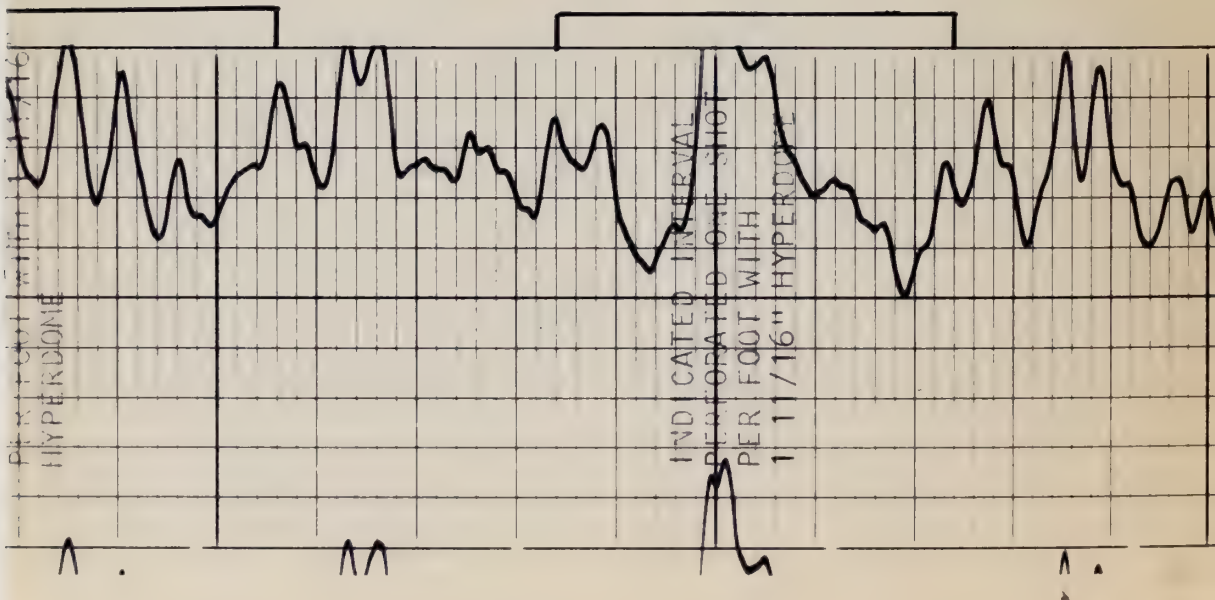


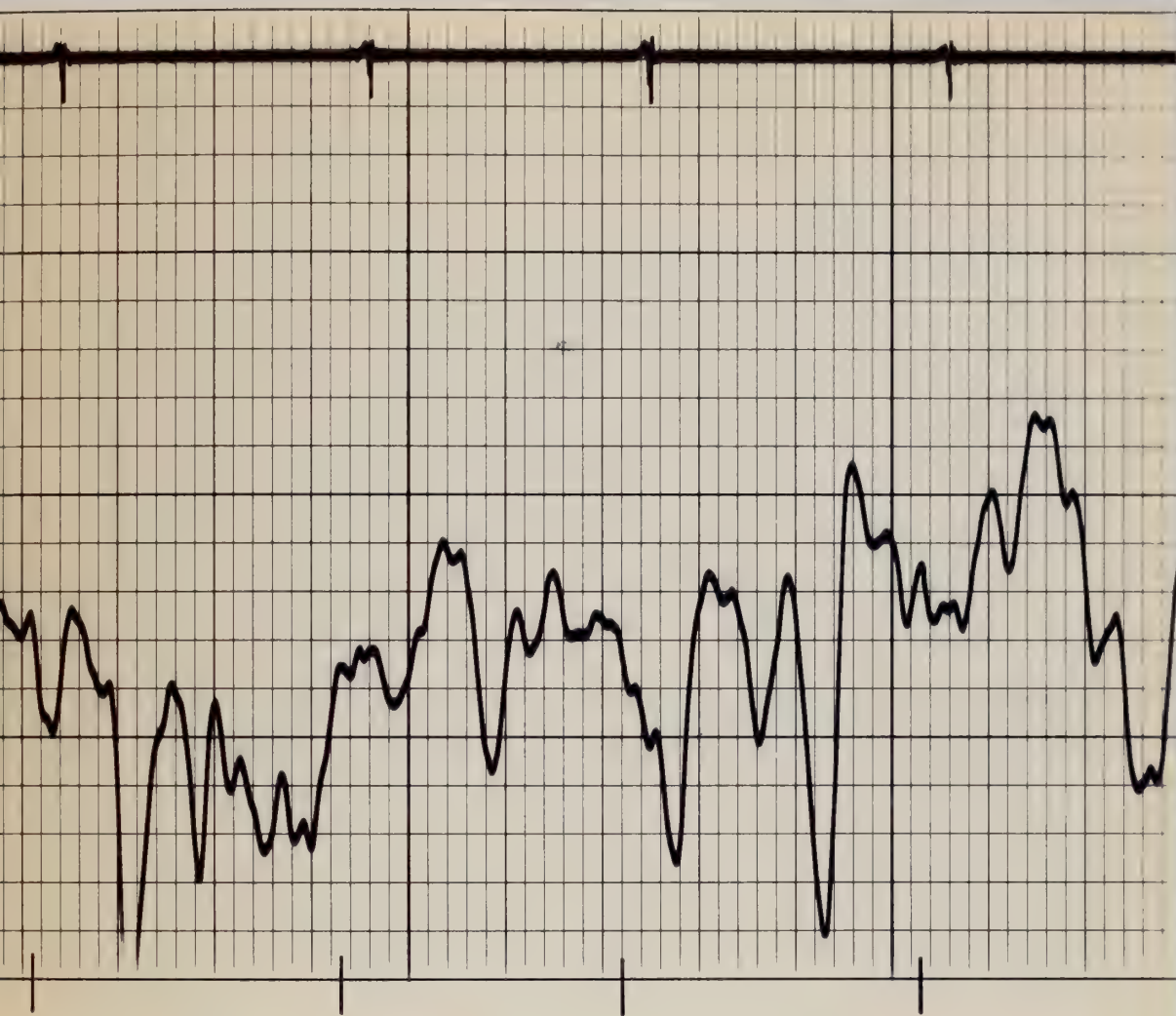
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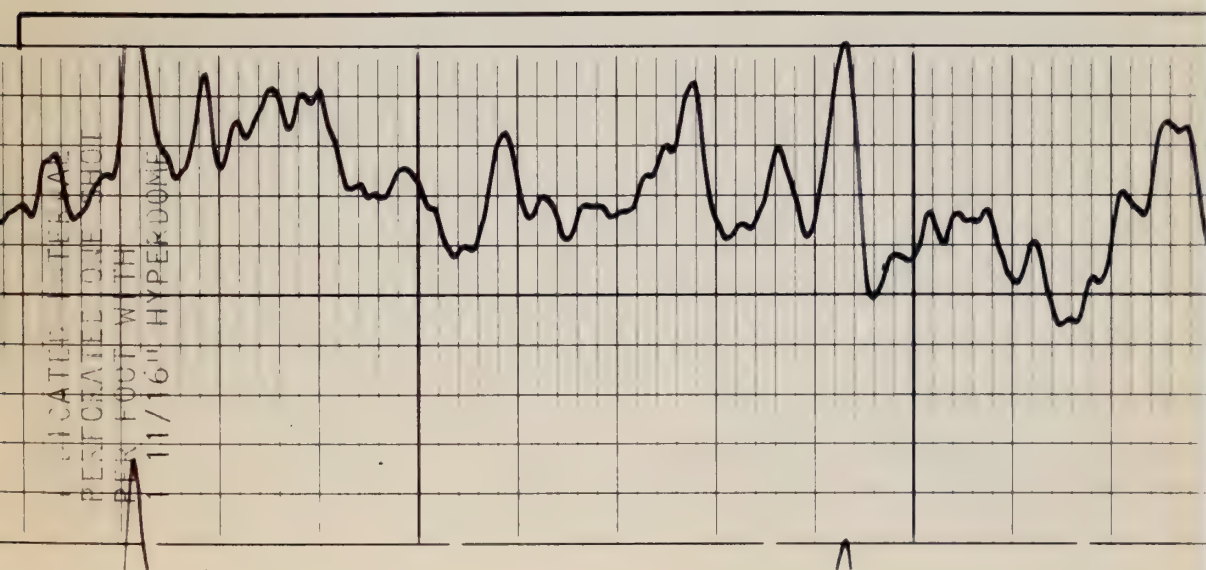


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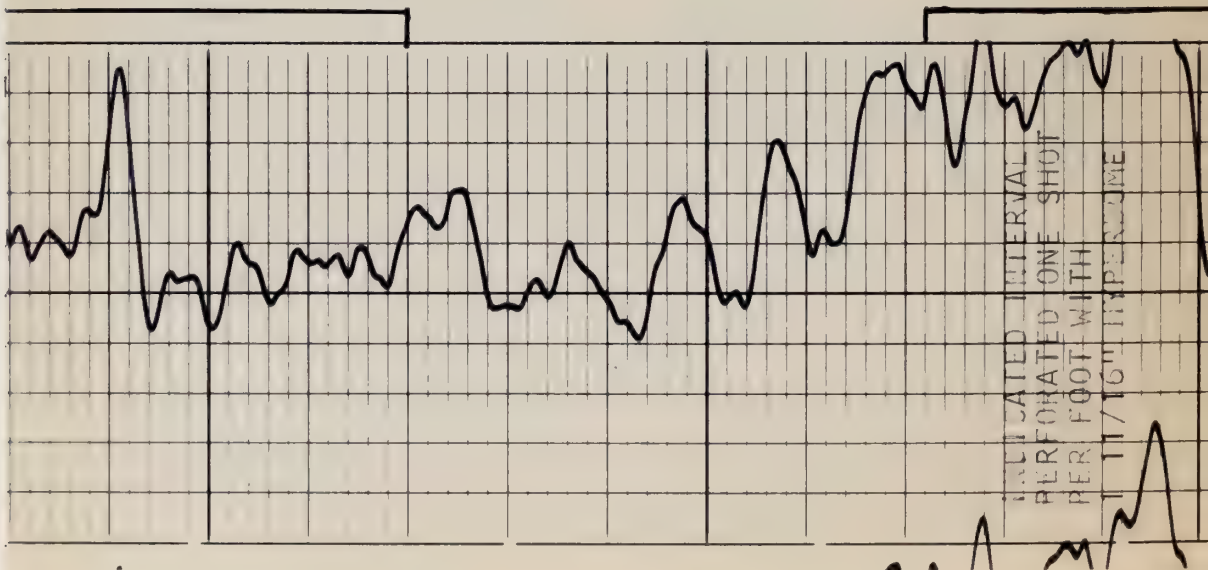
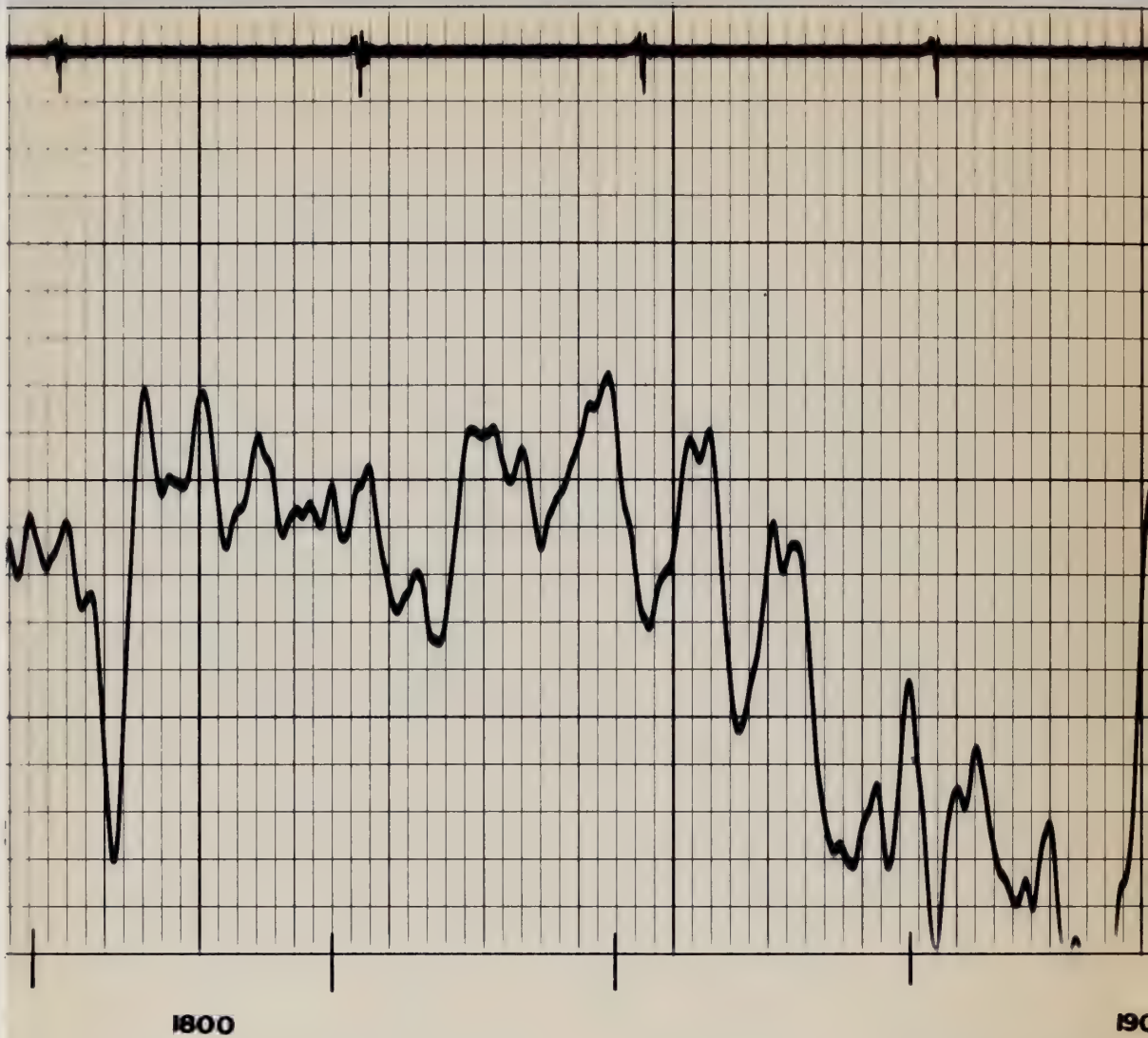


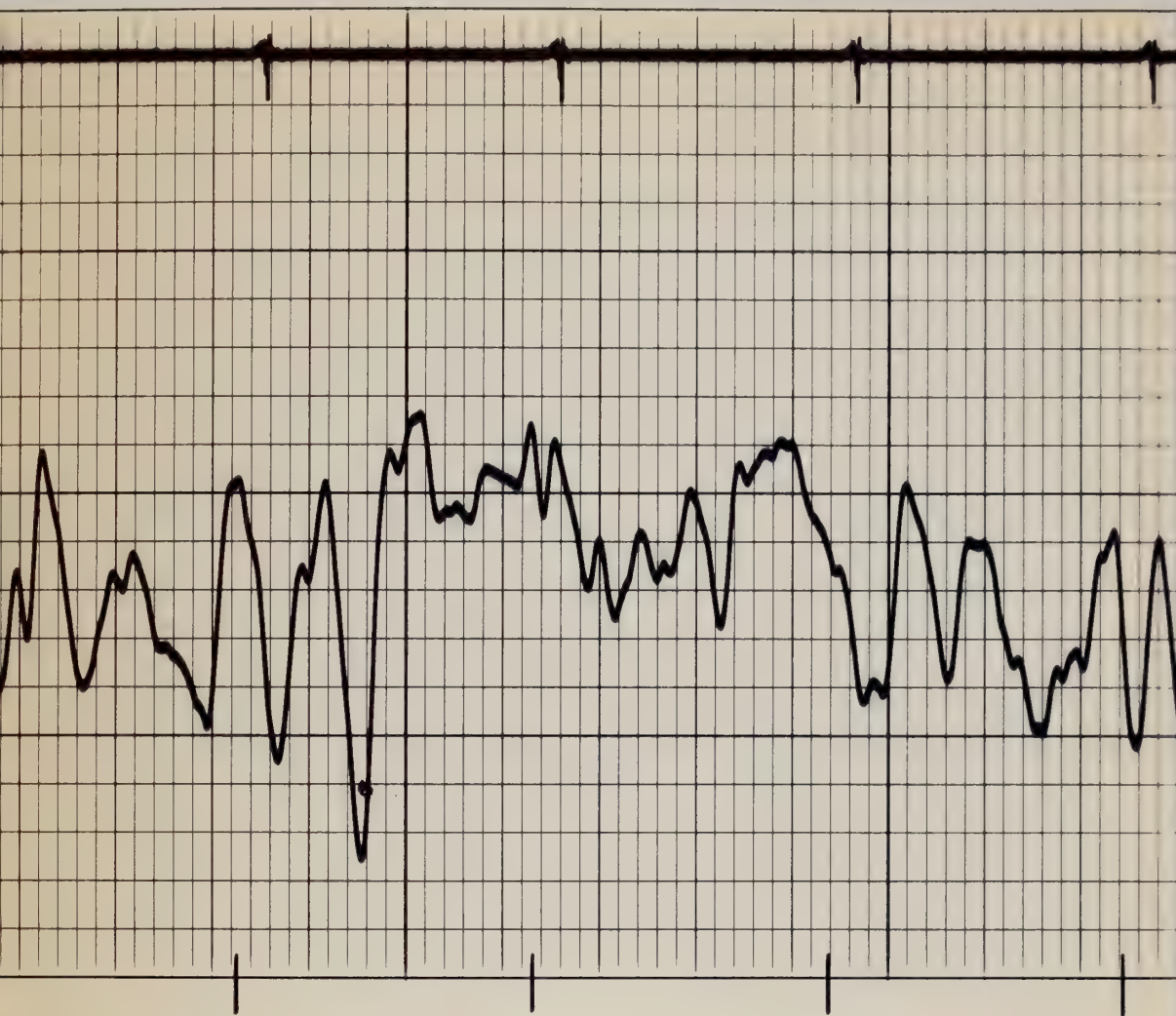


1700

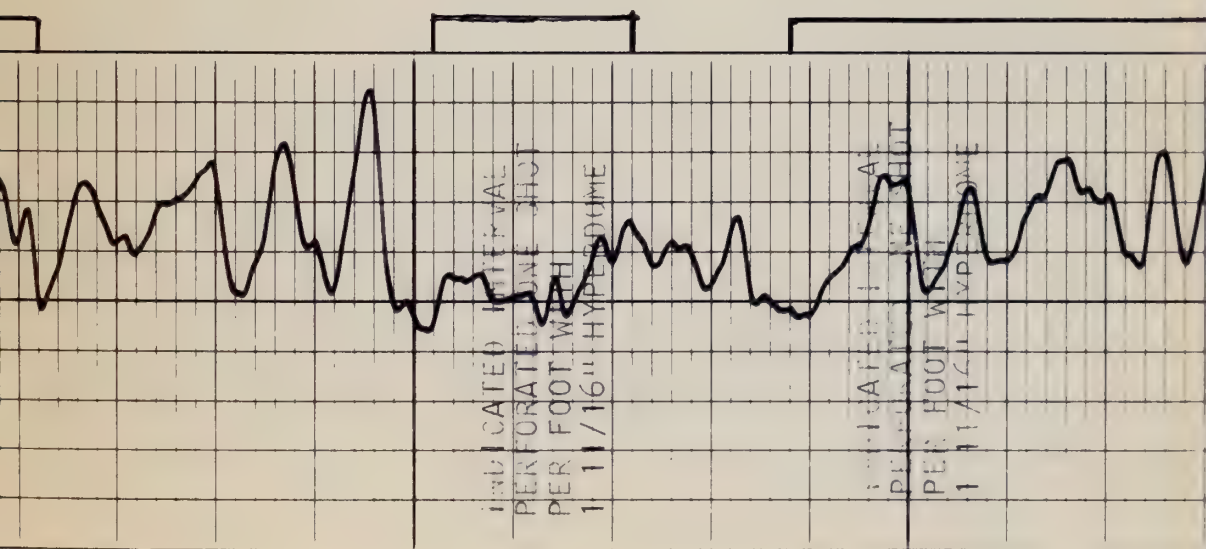


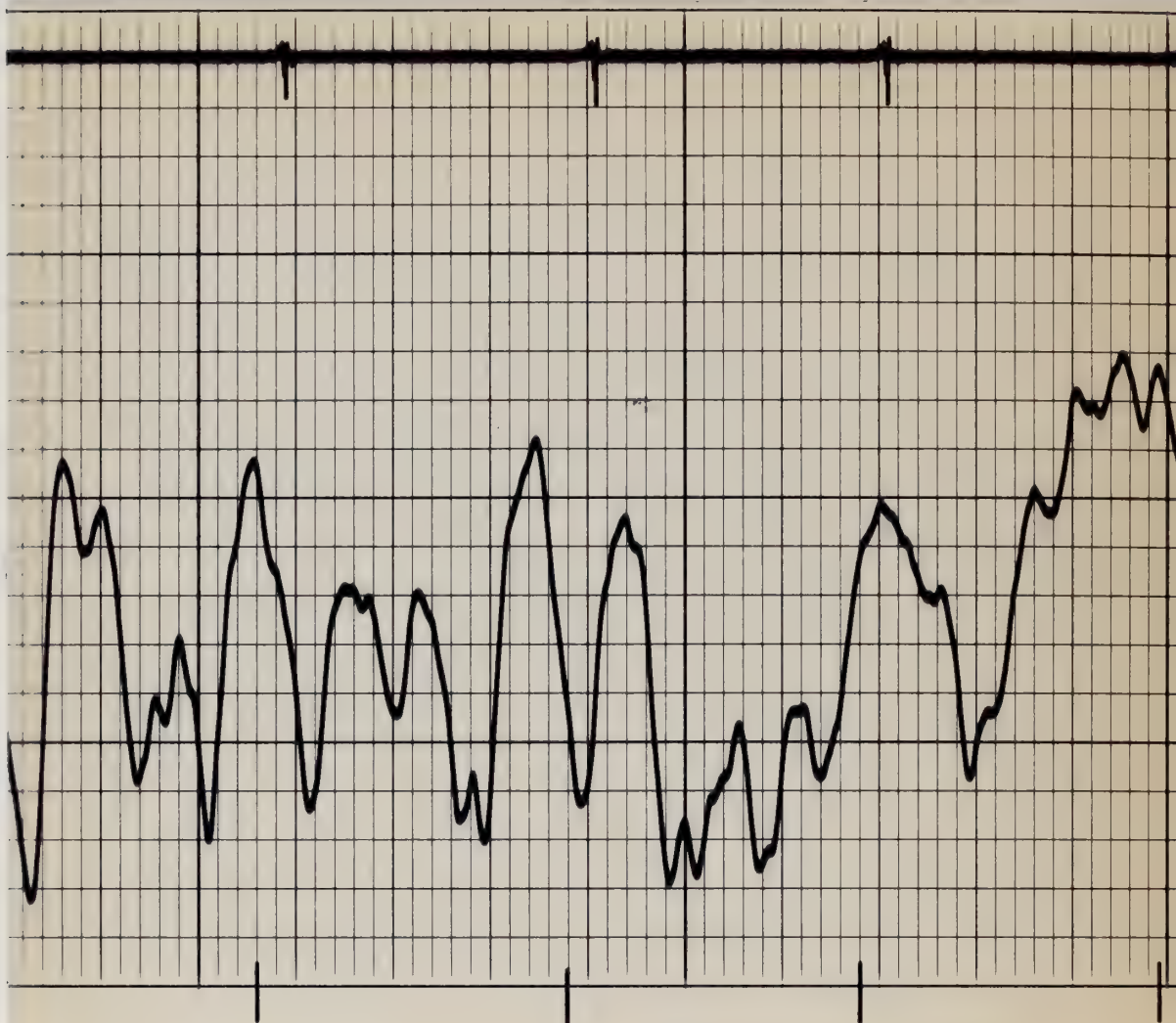
INDICATOR: PERMANENT
PERFORATED ONE-CHOL
PER FOOT WITH
11/16" HYPERDOME

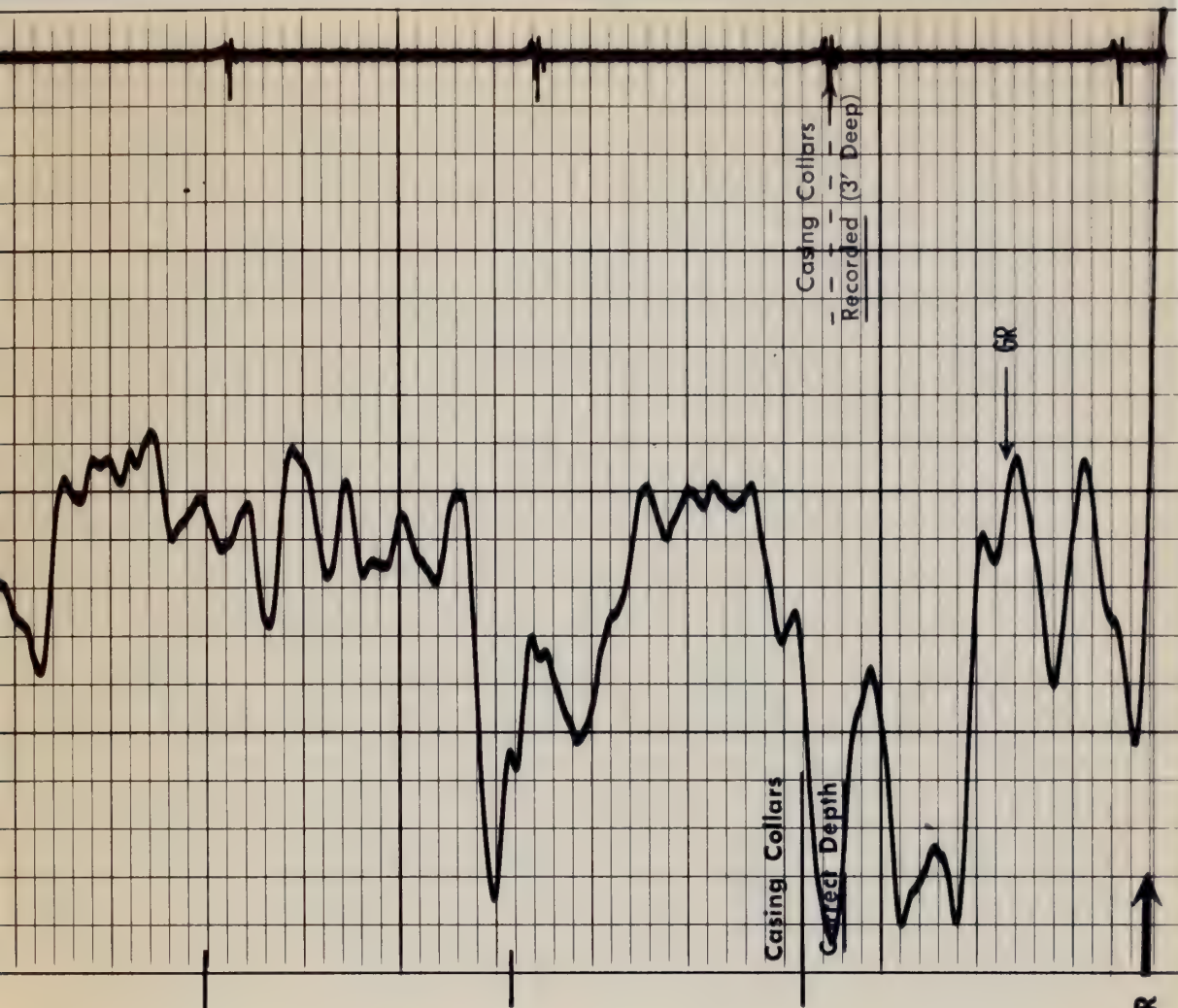




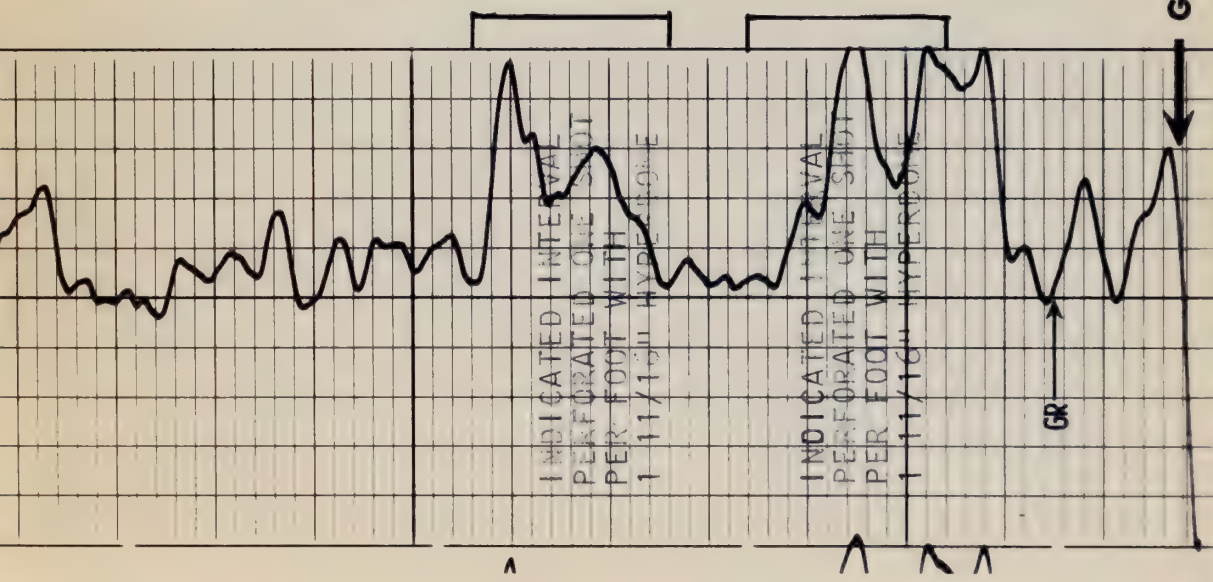
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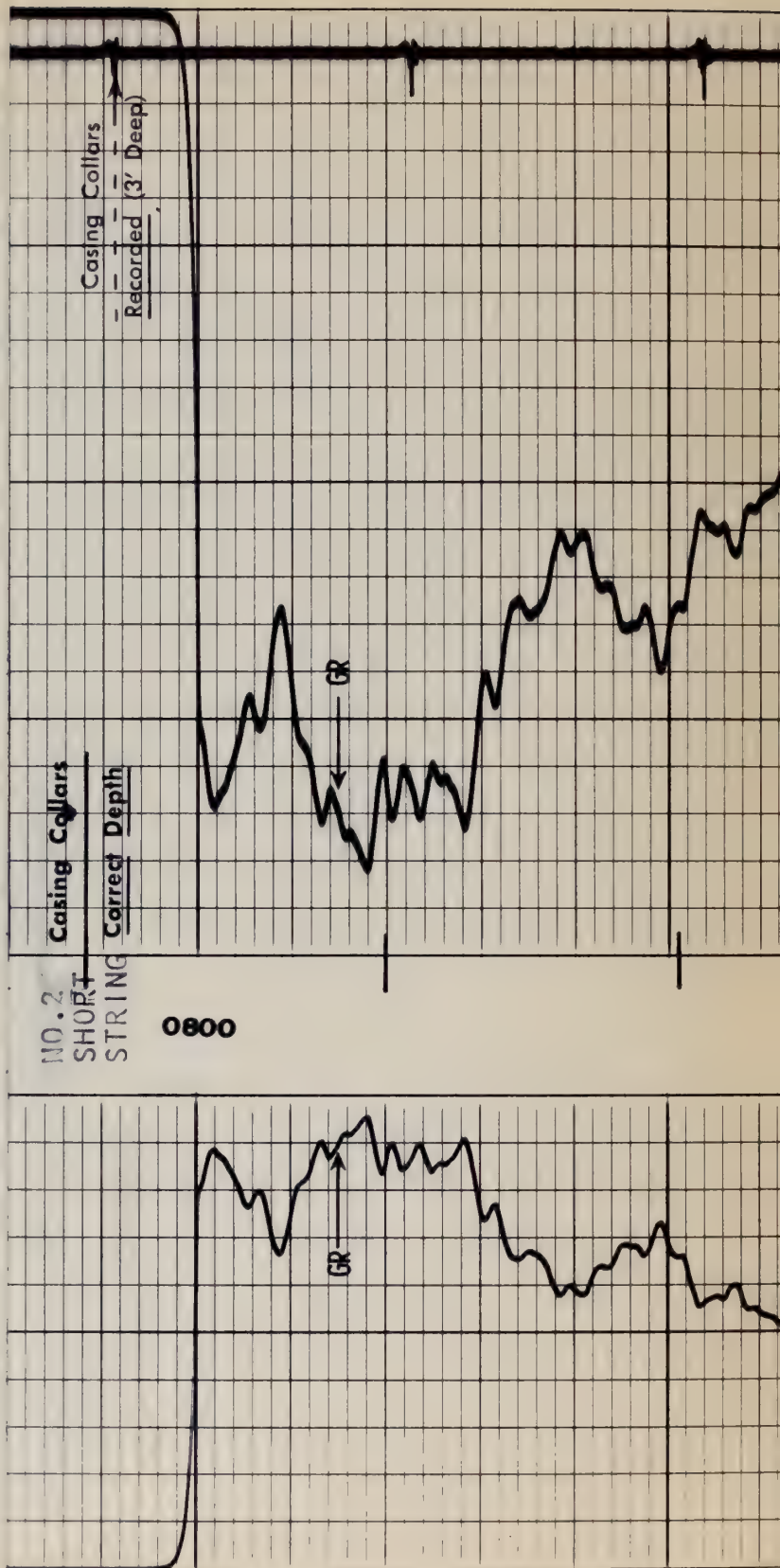


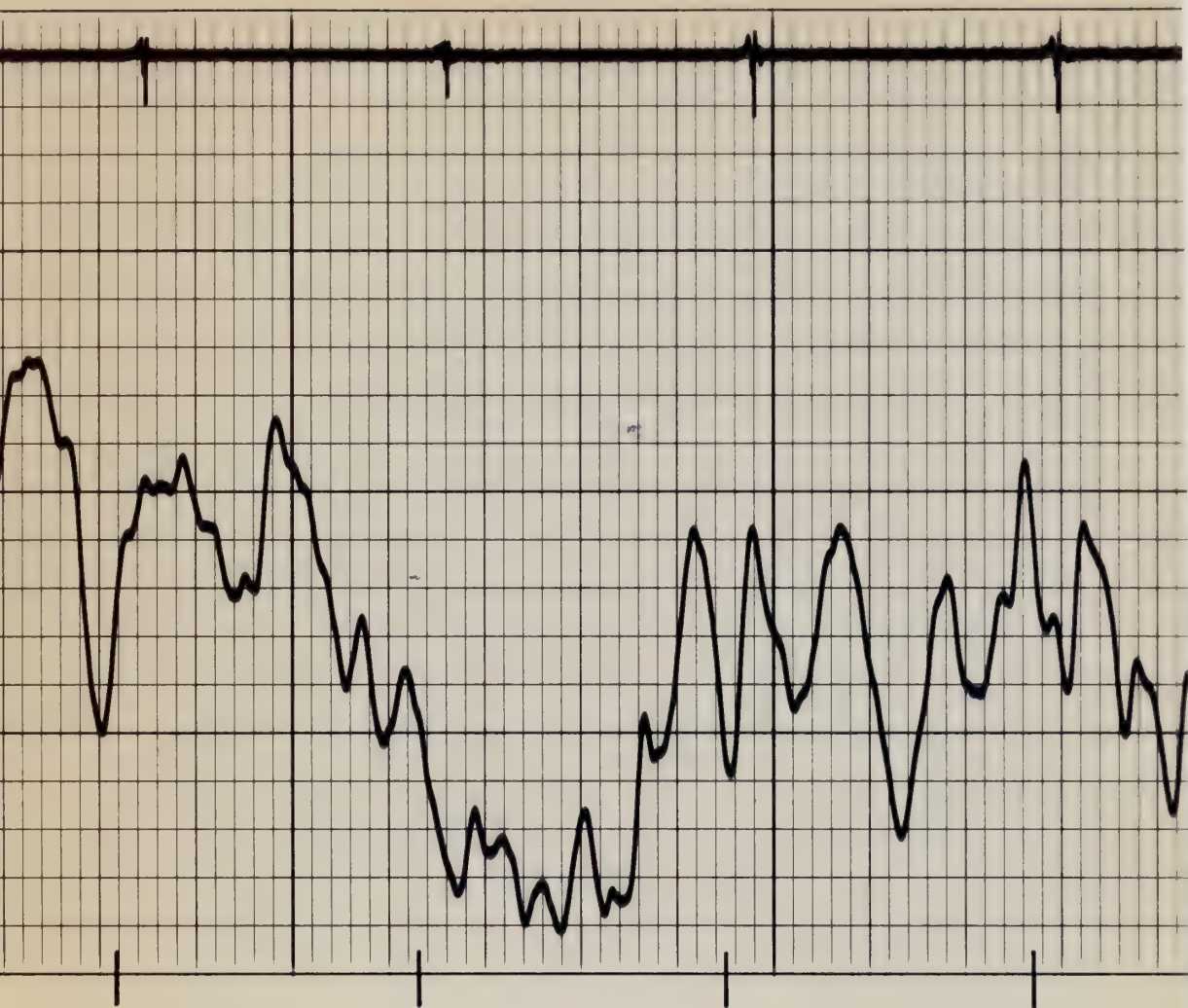




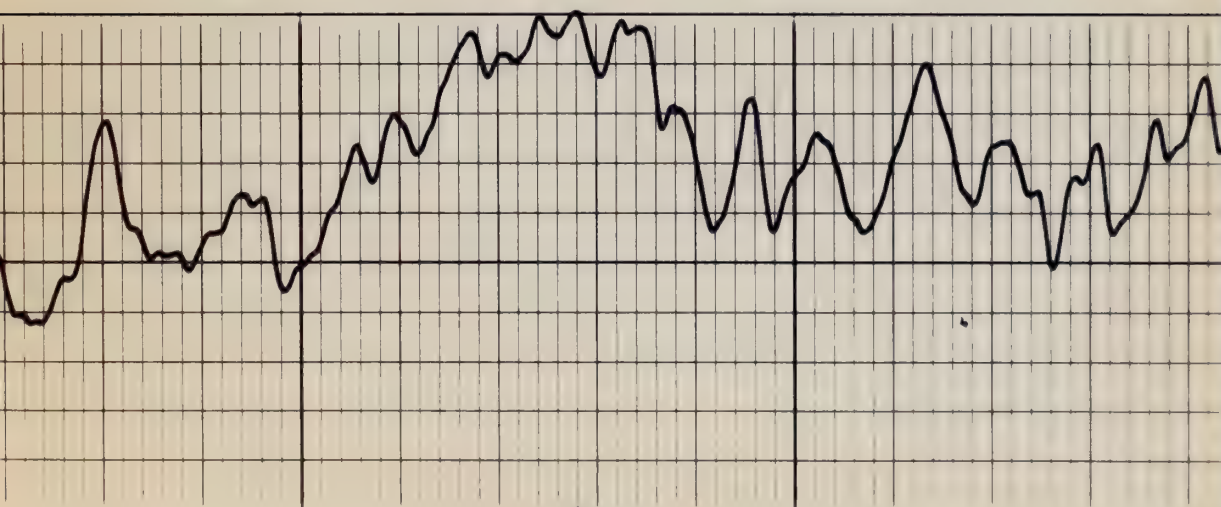
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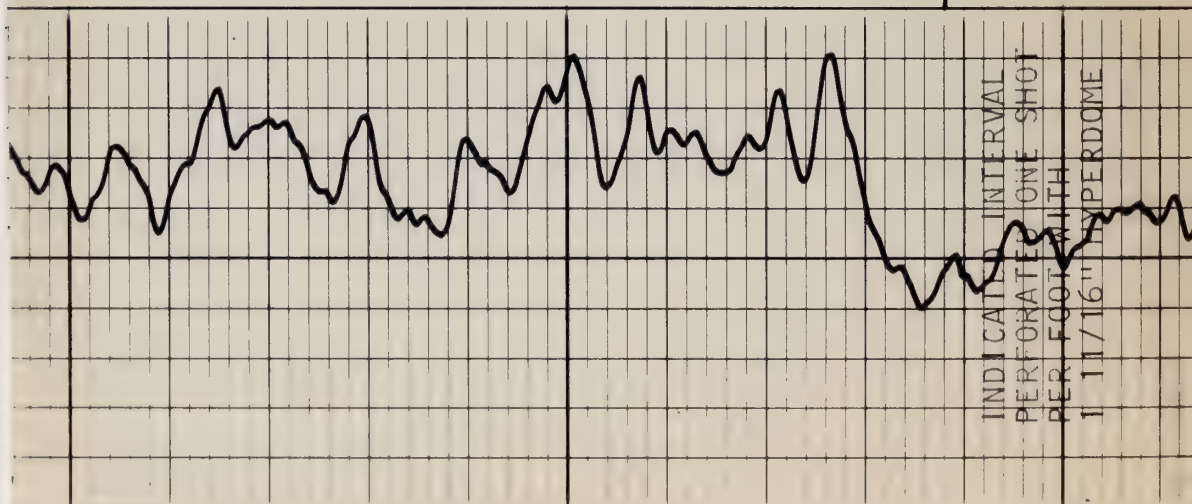
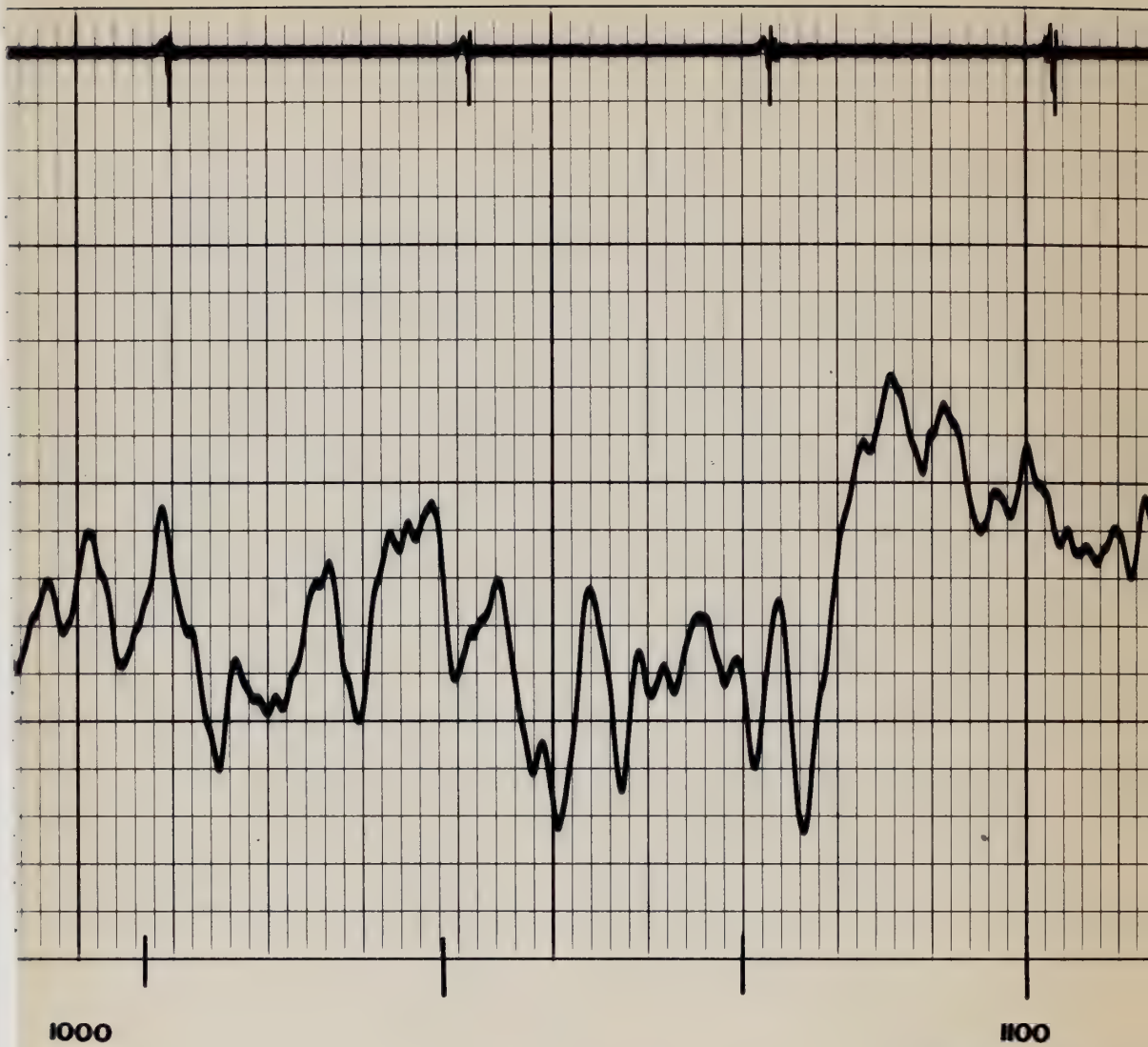


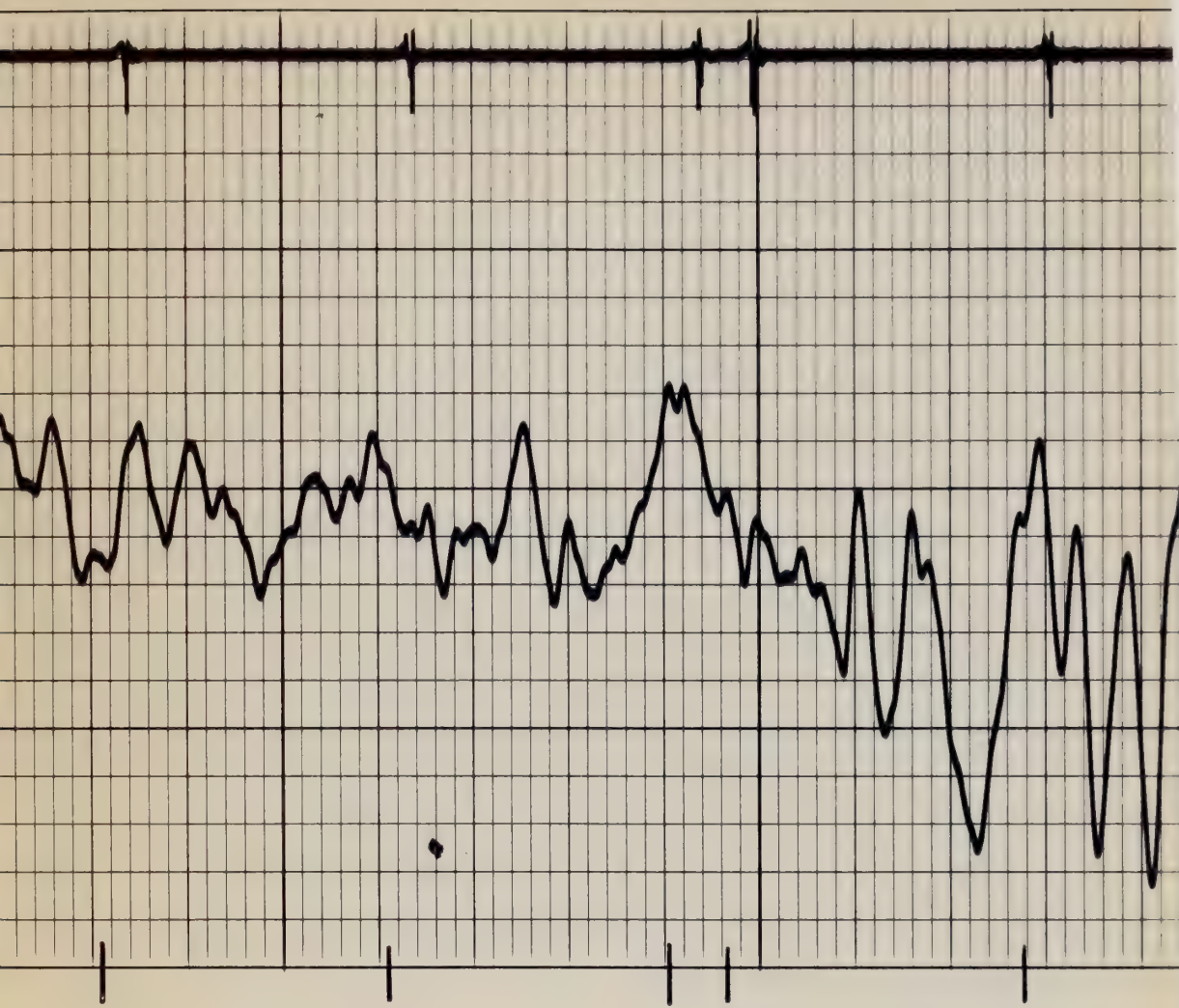


0900

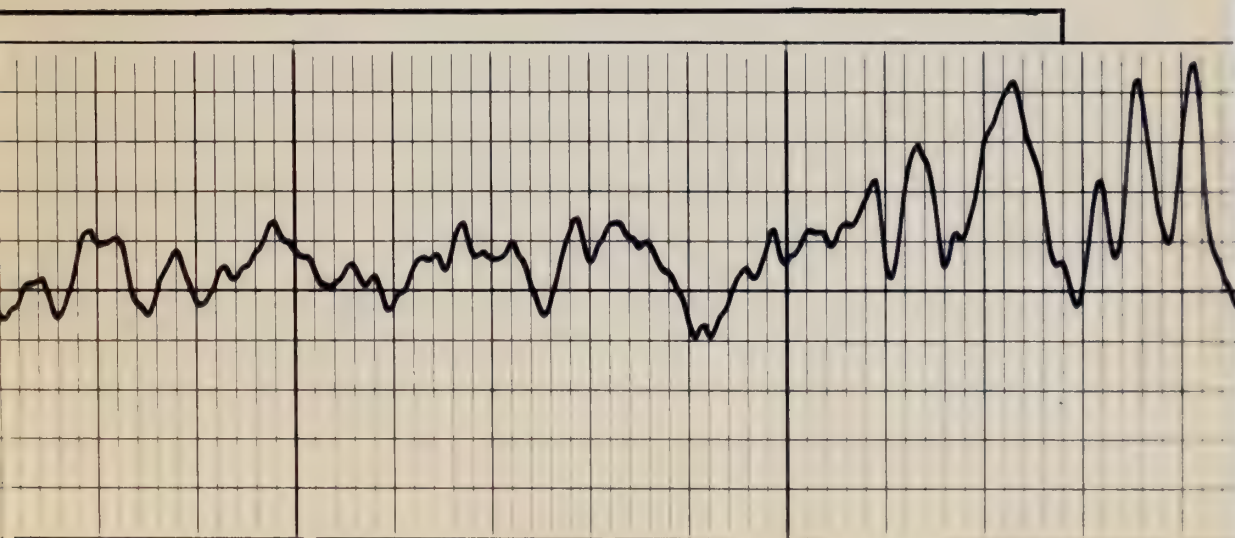


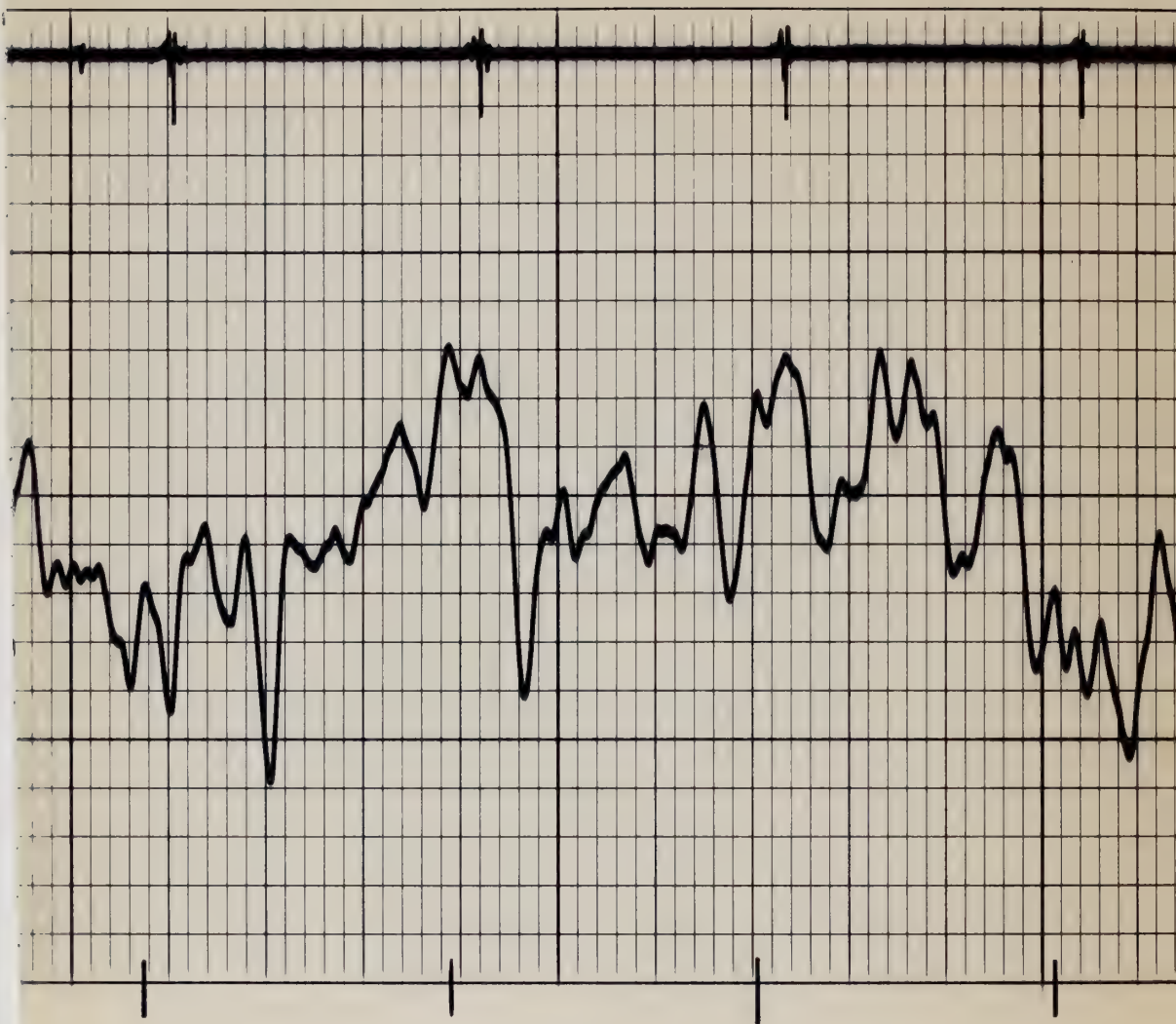
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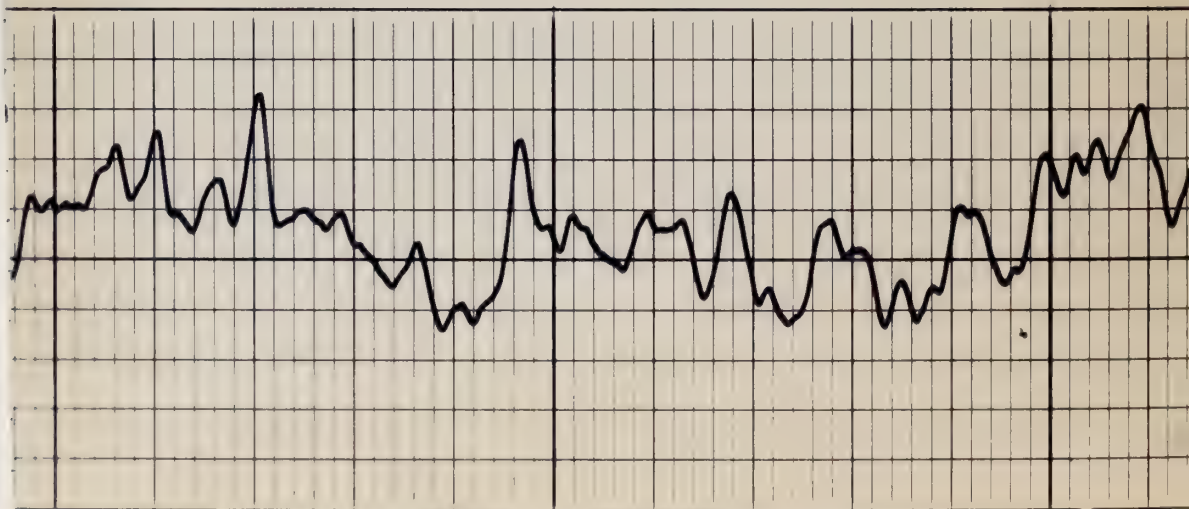


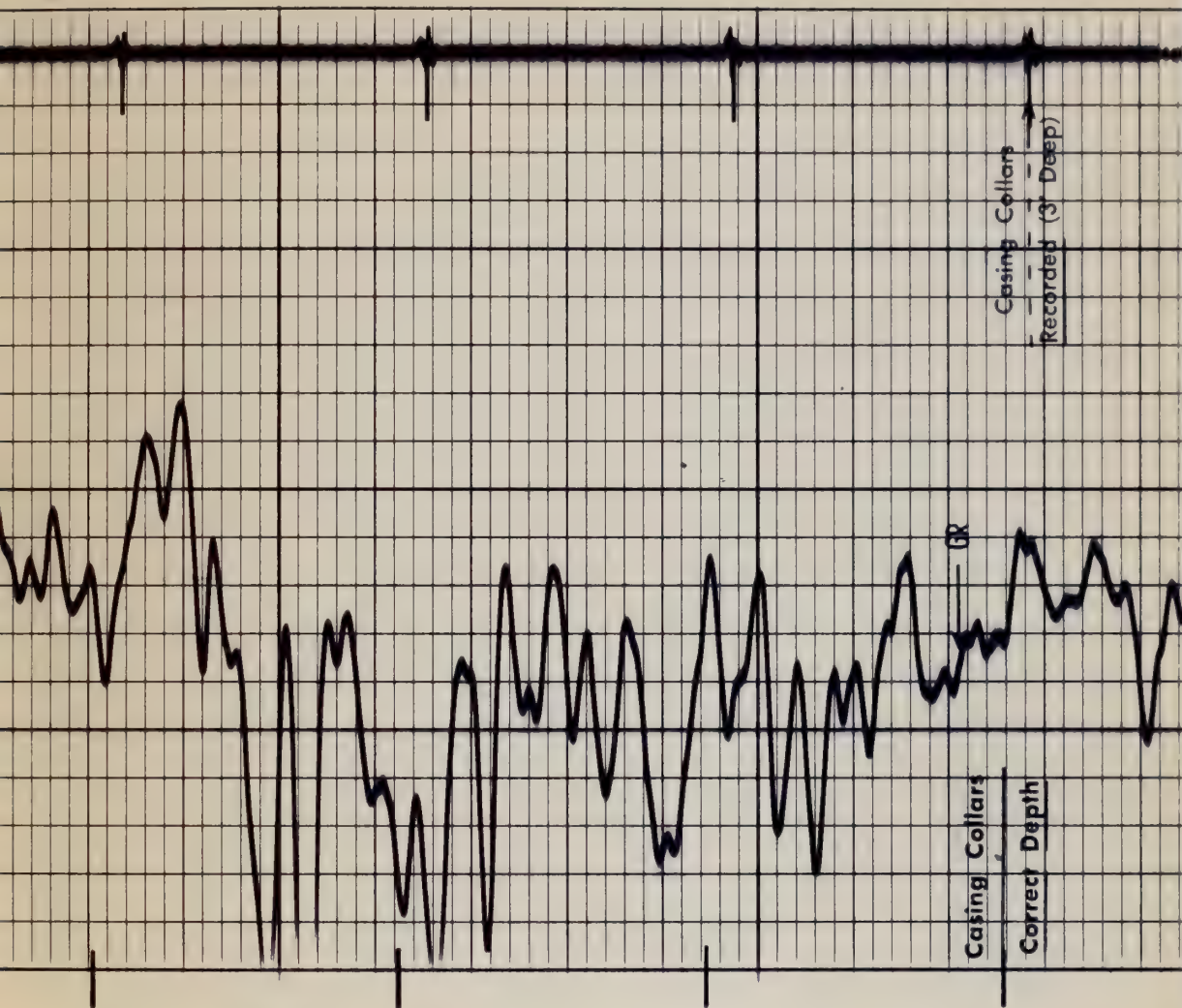
1200



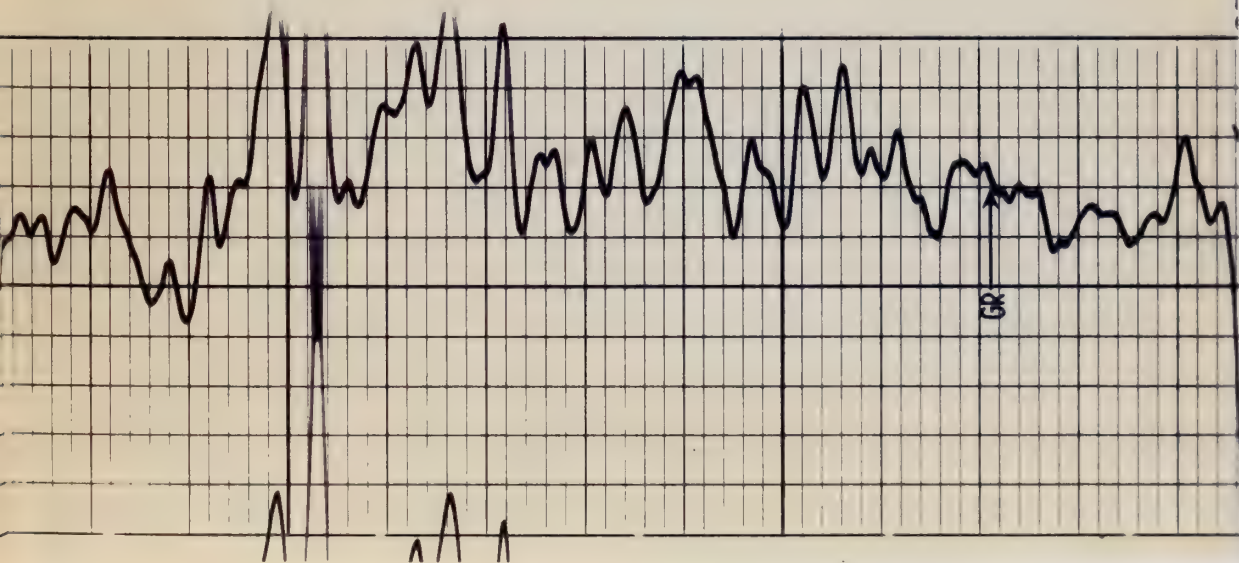


1300





1400



<div style="display: flex; justify-content: space-between;"> <div> <p>← GR FR →</p> </div> <div> <p>Recorded Casing Collars</p> </div> </div>	
<div style="display: flex; justify-content: space-between;"> <div> <p>← Casing Collars Correct Depth</p> </div> <div> <p>→</p> </div> </div>	<p>GAMMA RAY</p> <p>RADIOACTIVITY INCREASES</p>
<p>GAMMA RAY</p> <p>RADIOACTIVITY INCREASES</p>	<p>DEPTHS</p>
<p>COMPANY <u>ATLANTIC RICHFIELD COMPANY</u></p> <p>WELL <u>S.G. NO.17</u></p> <p>FIELD <u>SORGHUM GULCH</u></p> <p>COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u></p>	
<p>SCHL. FR <u>2277</u></p> <p>SCHL. TD <u>2285</u></p> <p>DRLR. TD <u>2305</u></p>	

Schlumberger

LATEROLOG

WITH GAMMA RAY

COUNTY RIO BLANCO
 FIELD or LOCATION SORGHUM GULCH
 WELL SORGHUM GULCH 1-A
 COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH 1-A

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION

Sec. 2 Twp. 3S Rge. 97W

Other Services:
 FDC-GR
 BHC-GR
 TEMP./AMP.-VDL

Permanent Datum: GL, Elev. _____
 Log Measured From GL, 0 Ft. Above Perm. Datum
 Drilling Measured From GL

Elev.: K.B. _____
 D.F. _____
 G.L. _____

Date	2-1-75					
Run No.	ONE					
Depth—Driller	1180					
Depth—Logger	1182					
Btm. Log Interval	1179					
Top Log Interval	230					
Casing—Driller	7	@ 225	@	@	@	@
Casing—Logger	230					
Bit Size	6-1/4					
Type Fluid in Hole	FORMATION WATER					
Dens.	Visc.					
pH	Fluid Loss	ml	ml	ml	ml	ml
Source of Sample						
R _m @ Meas. Temp.	@	°F	@	°F	@	°F
R _{mf} @ Meas. Temp.	@	°F	@	°F	@	°F
R _{mc} @ Meas. Temp.	@	°F	@	°F	@	°F
Source: R _{mf}	R _{mc}					
R _m @ BHT	@	°F	@	°F	@	°F
Time Since Circ.						
Max. Rec. Temp. °F						
Equip.	Location	5602	GJ			
Recorded By		GEIGER				
Witnessed By		POWERS				

The well name, location and borehole reference data must be filled in before logging.

REMARKS * NO CIRCULATED SAMPLE WAS AVAILABLE

Changes in Mud Type or Additional Samples				Scale Changes			
Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole
Depth - Driller							
Type Fluid in Hole							
Dens.	Visc.						
pH	Fluid Loss	ml					
Source of Sample				Equipment Data			
R _m	@ Meas. Temp.	@ °F	@ °F	Run No.	Tool Type	Tool Pos.	Other
R _{mf}	@ Meas. Temp.	@ °F	@ °F				
R _{mc}	@ Meas. Temp.	@ °F	@ °F				
Source: R _{mf} R _{mc}							
R _m	@ BHT	@ °F	@ °F				
R _{mf}	@ BHT	@ °F	@ °F				
R _{mc}	@ BHT	@ °F	@ °F				

Equip. Used: CART. No.

PANEL No. E-790

SONDE No. 850

Spacing: BEAM WIDTH: LL-7 USED

GUARD LENGTH: LL-7 USED

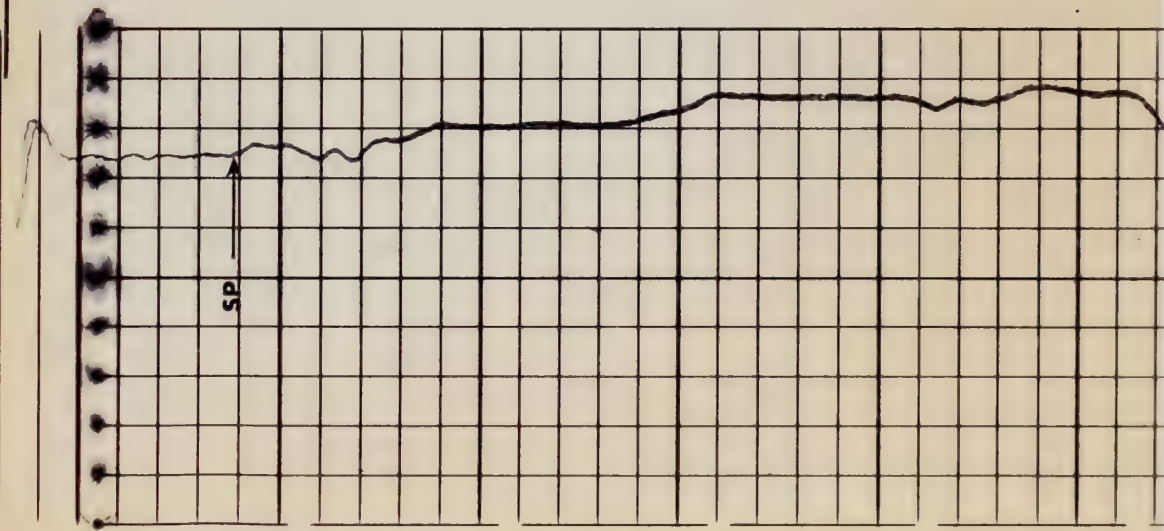
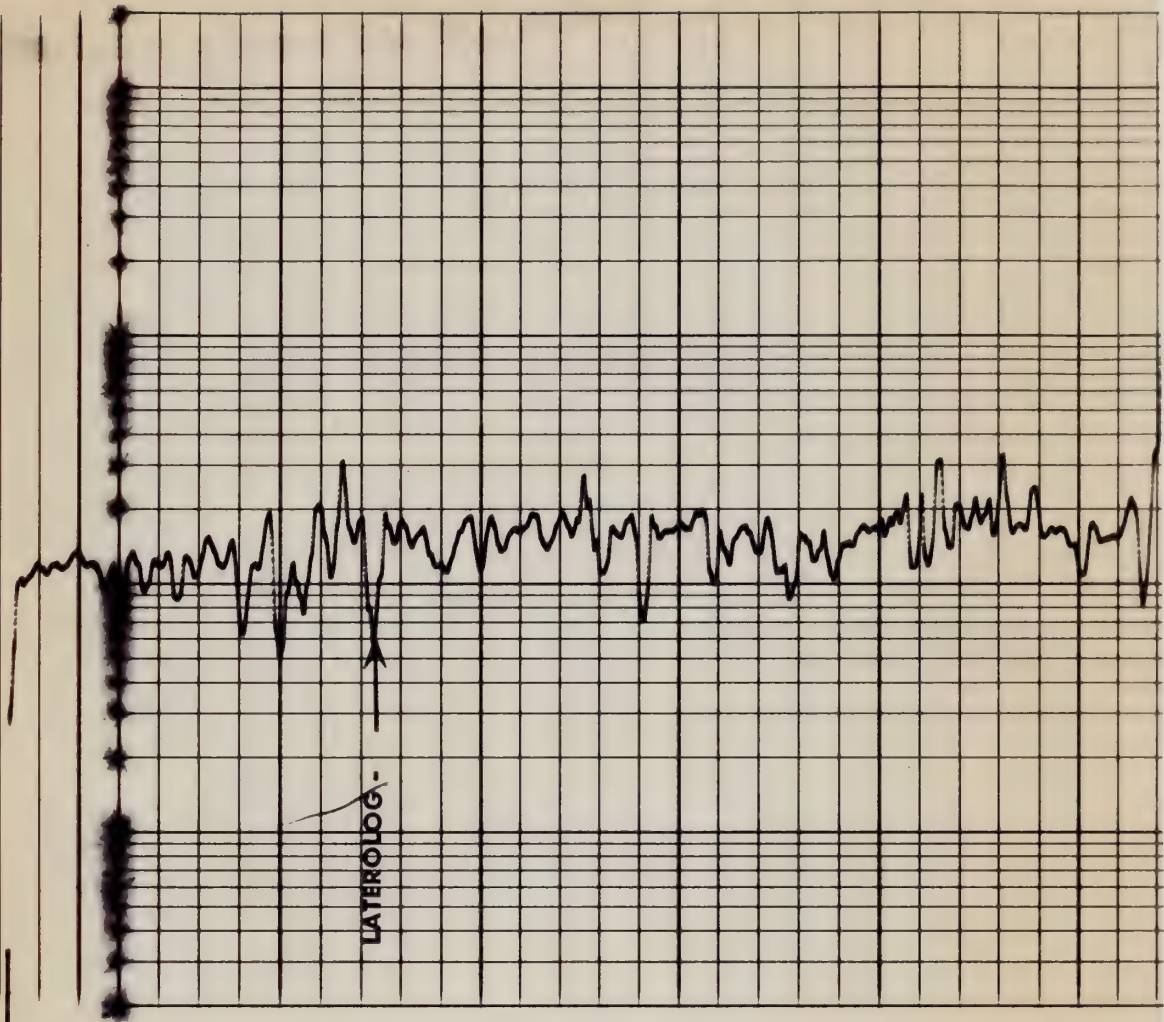
SPONTANEOUS POTENTIAL
millivolts

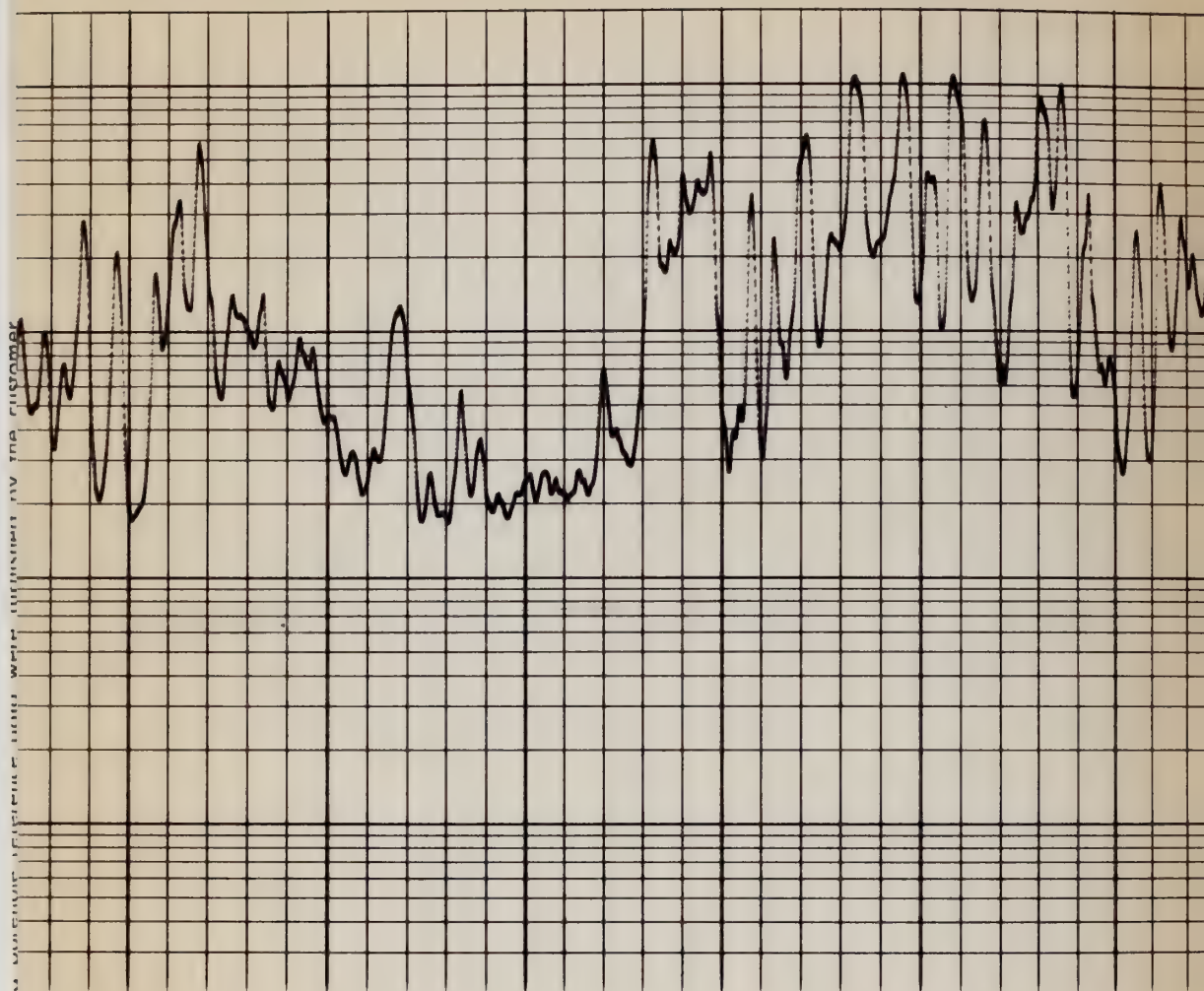
Depths

RESISTIVITY
ohms. m²/m

LATEROLOG

Casing

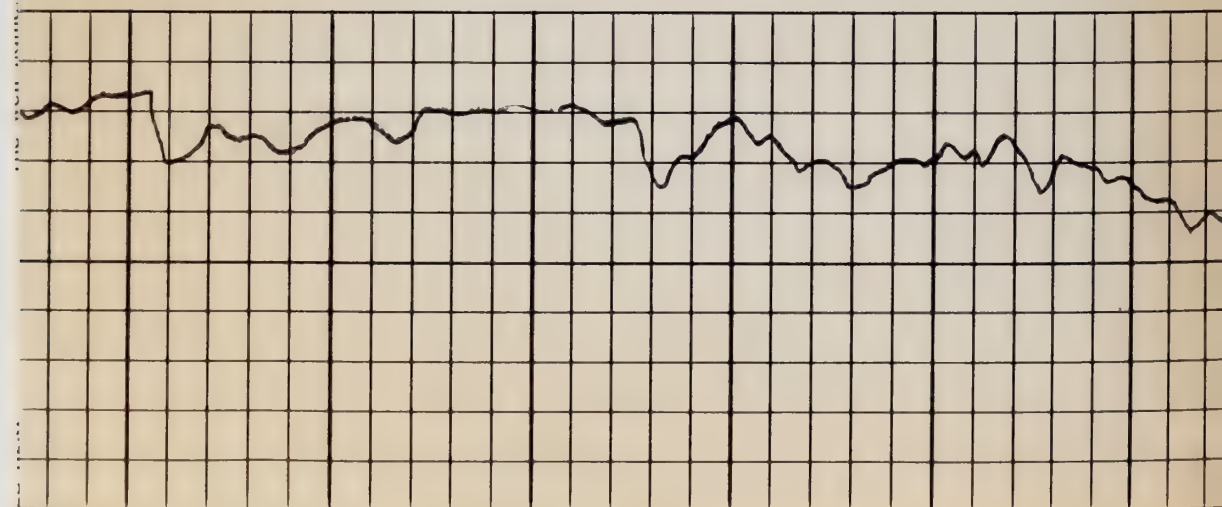


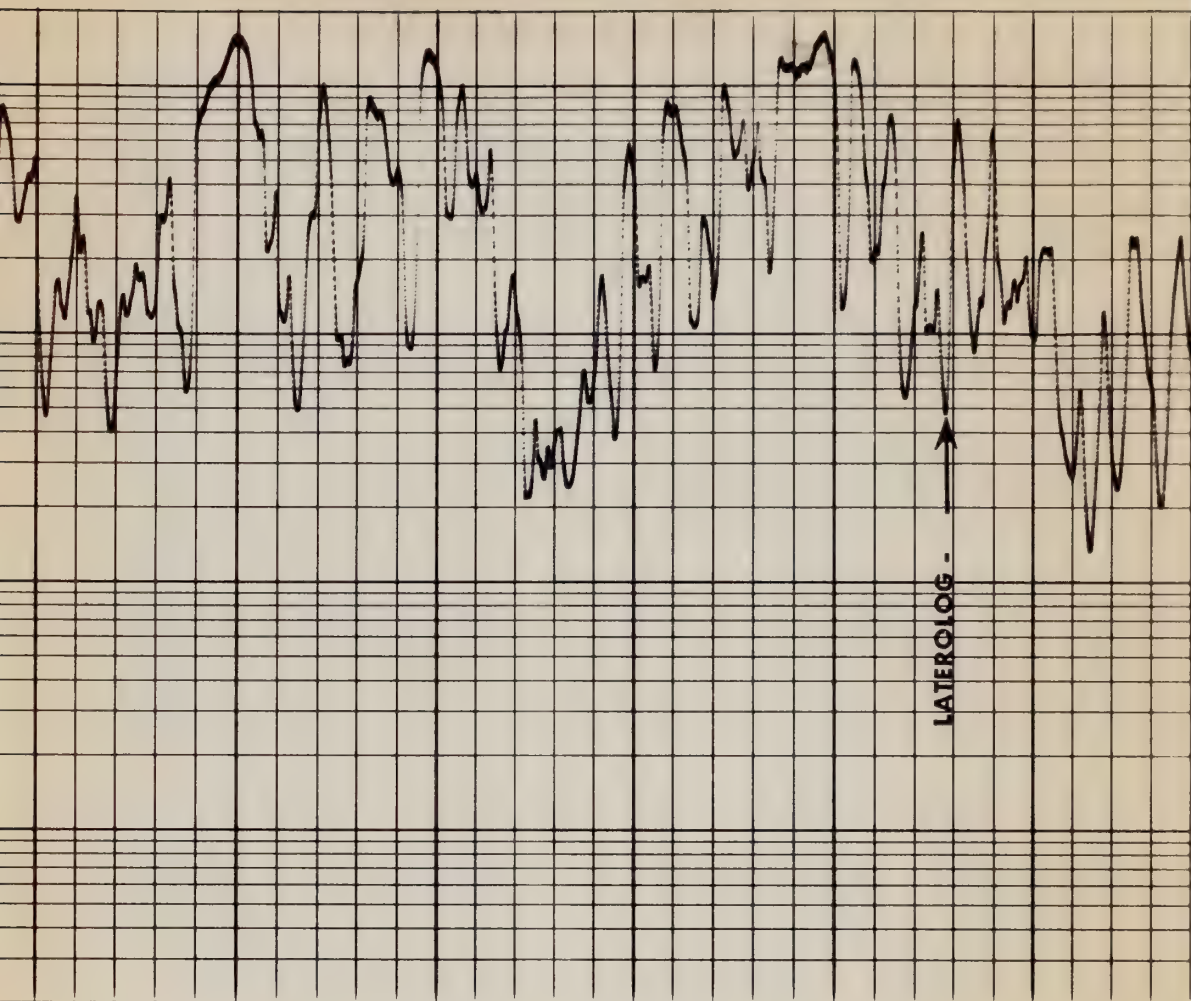


0600

0700

0800

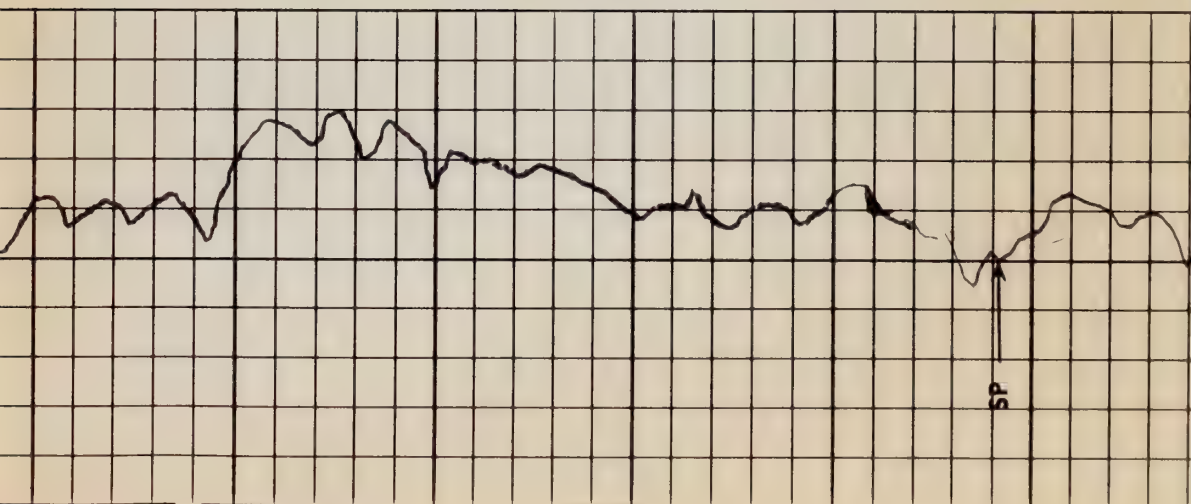




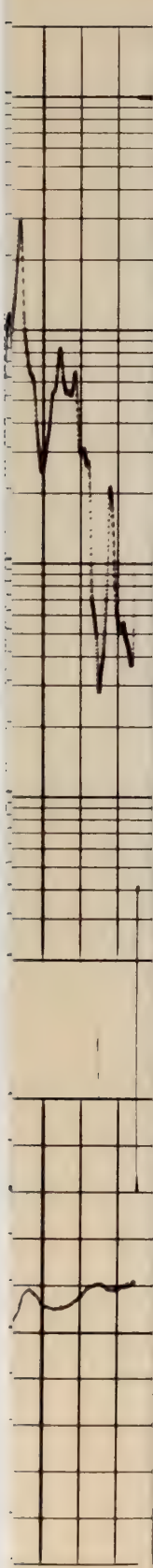
0900

1000

1100

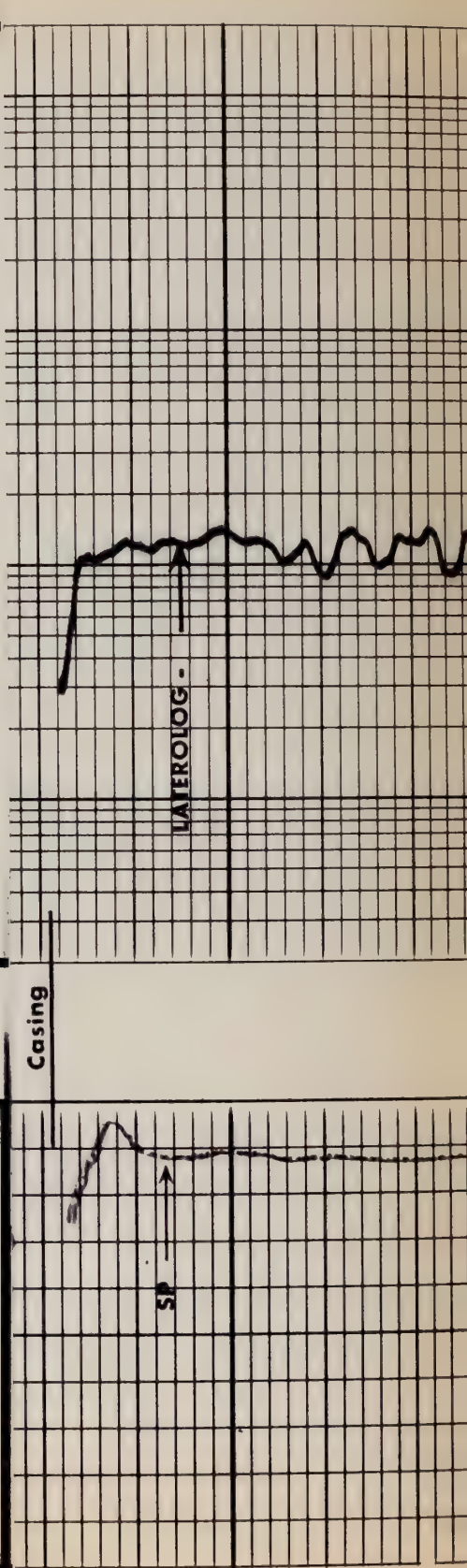


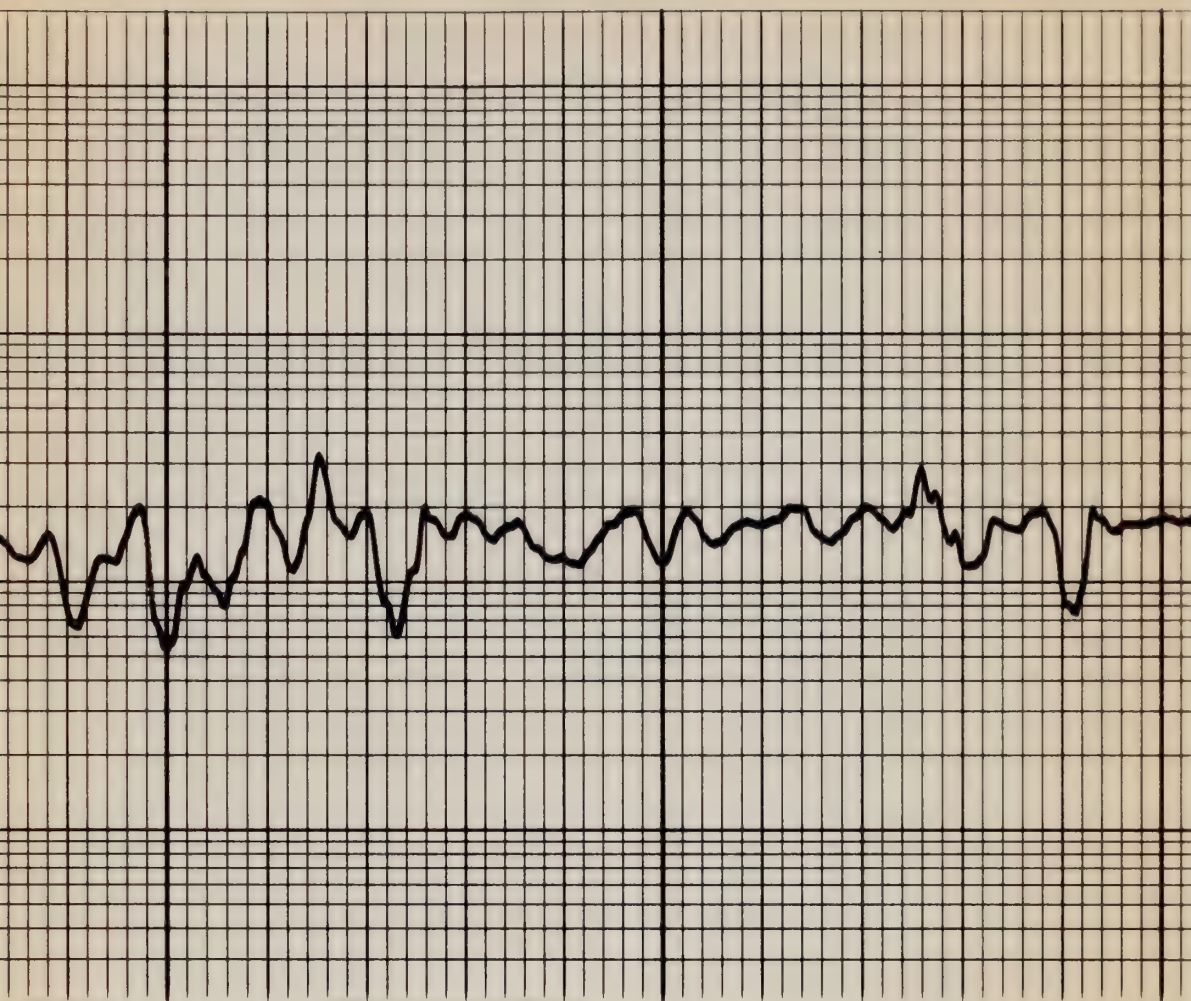
SP



DETAIL LOG
" = 100'

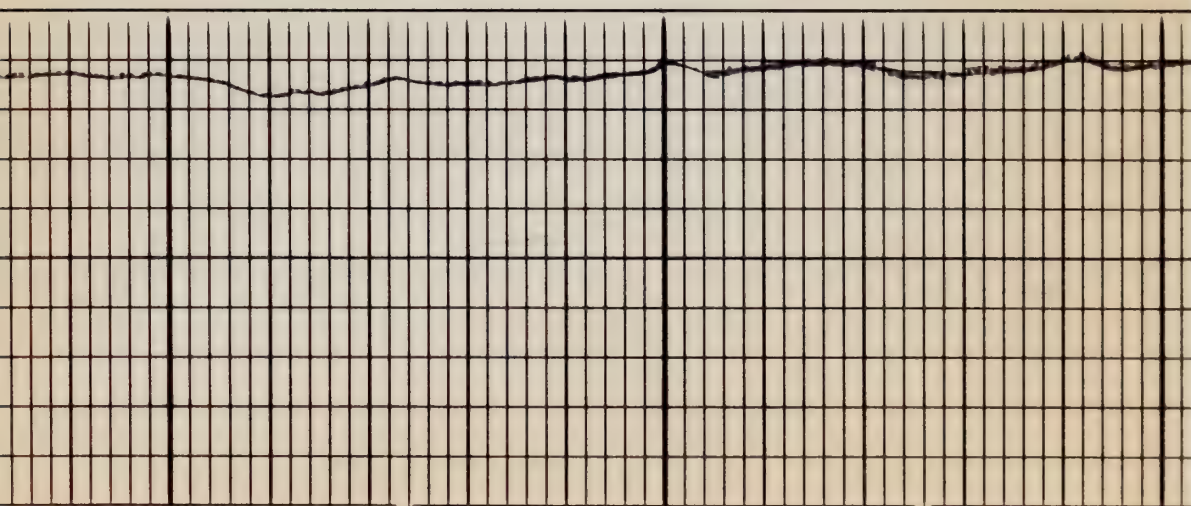
SPONTANEOUS - POTENTIAL MILLIVOLTS	DEPTHS	RESISTIVITY OHMS. M ² /M
- $\left \begin{array}{c} 10 \\ \hline \end{array} \right +$ MV		LATEROLOG
		2.0 10 100 1000 10000 20000

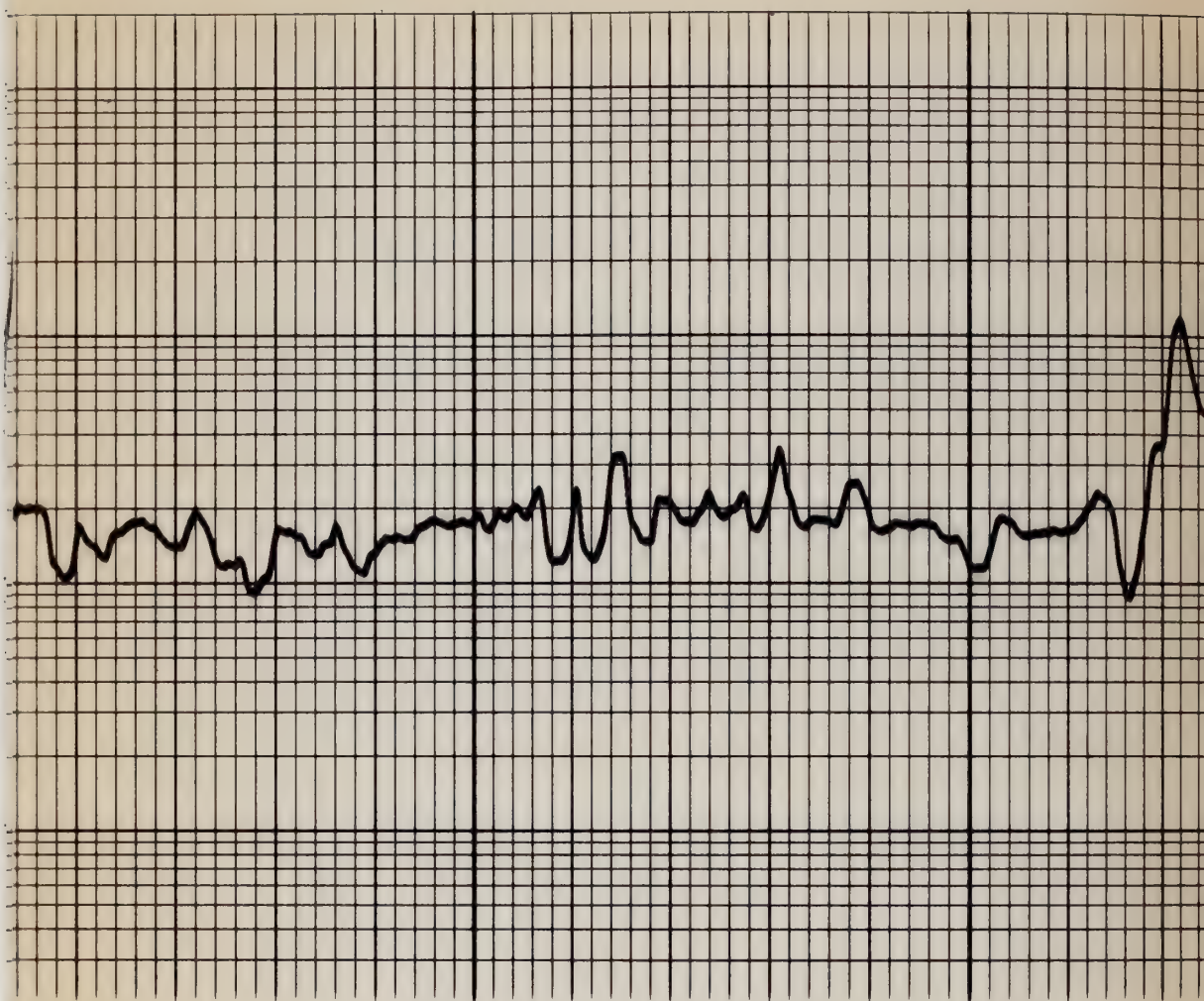




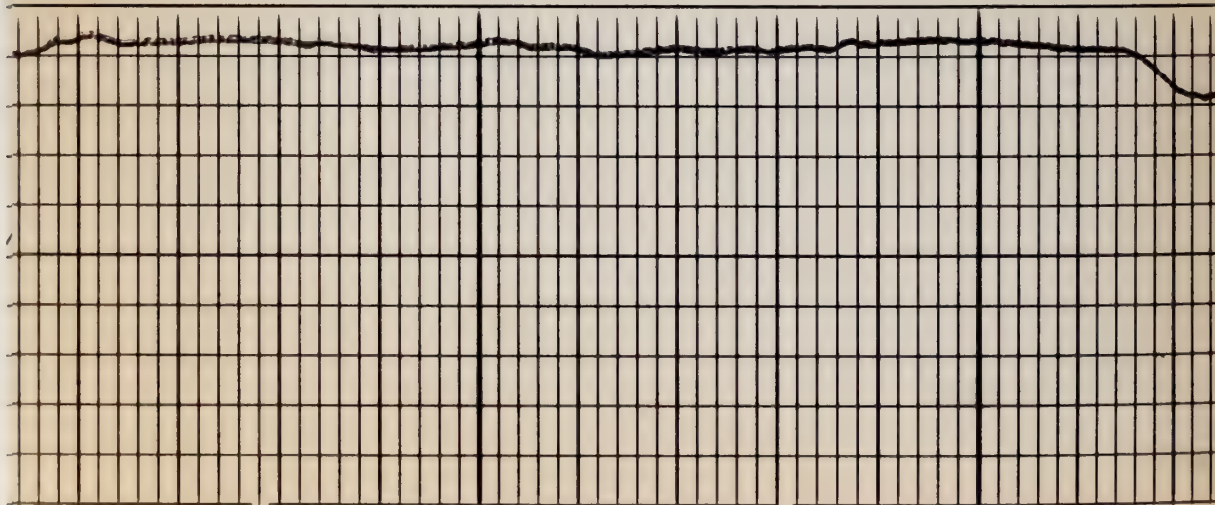
0300

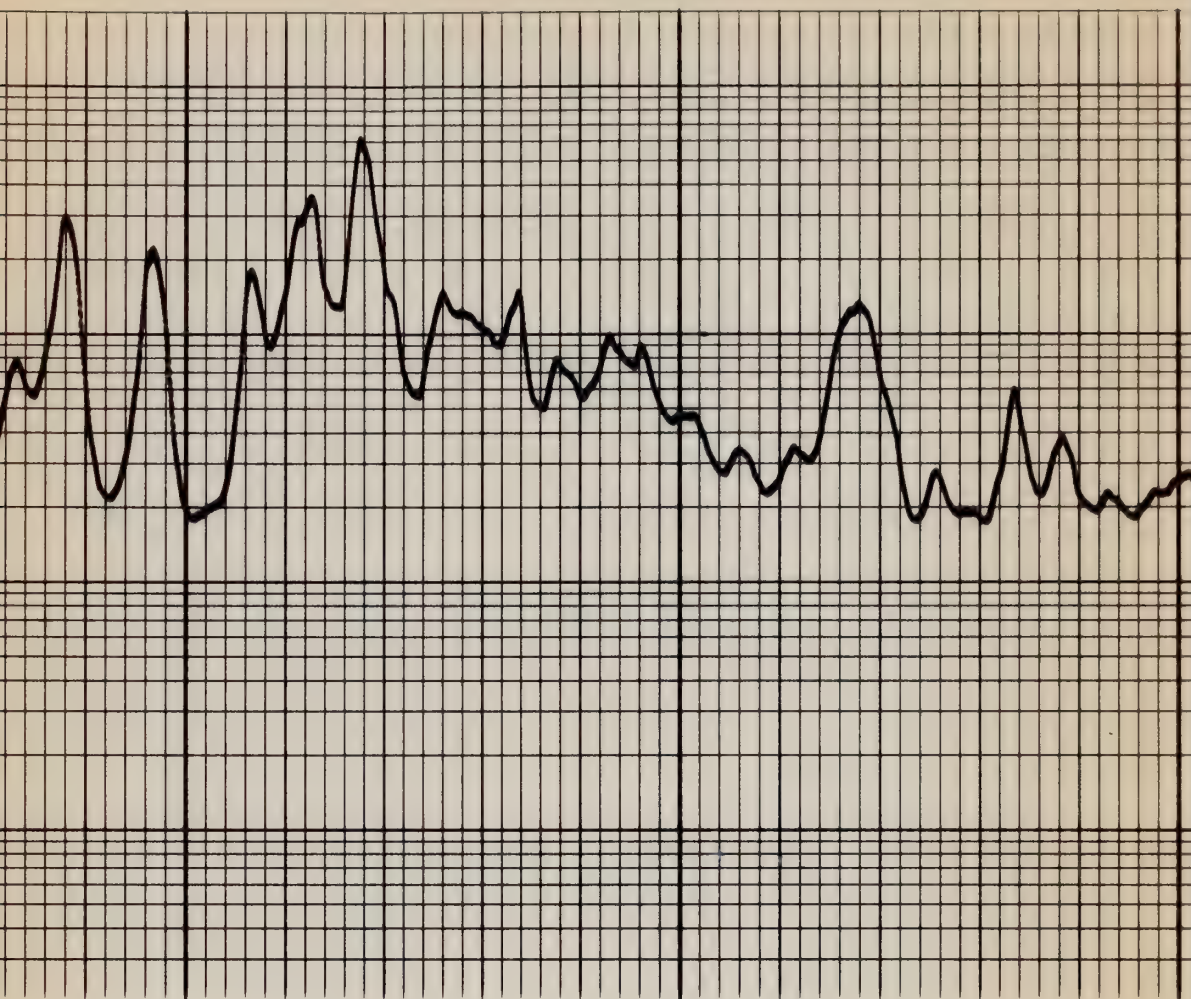
0400



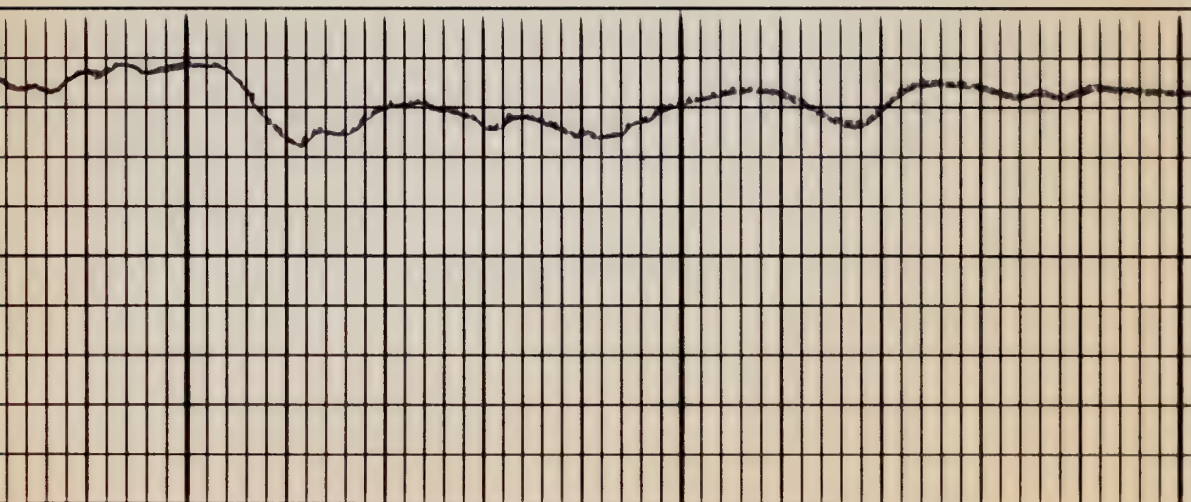


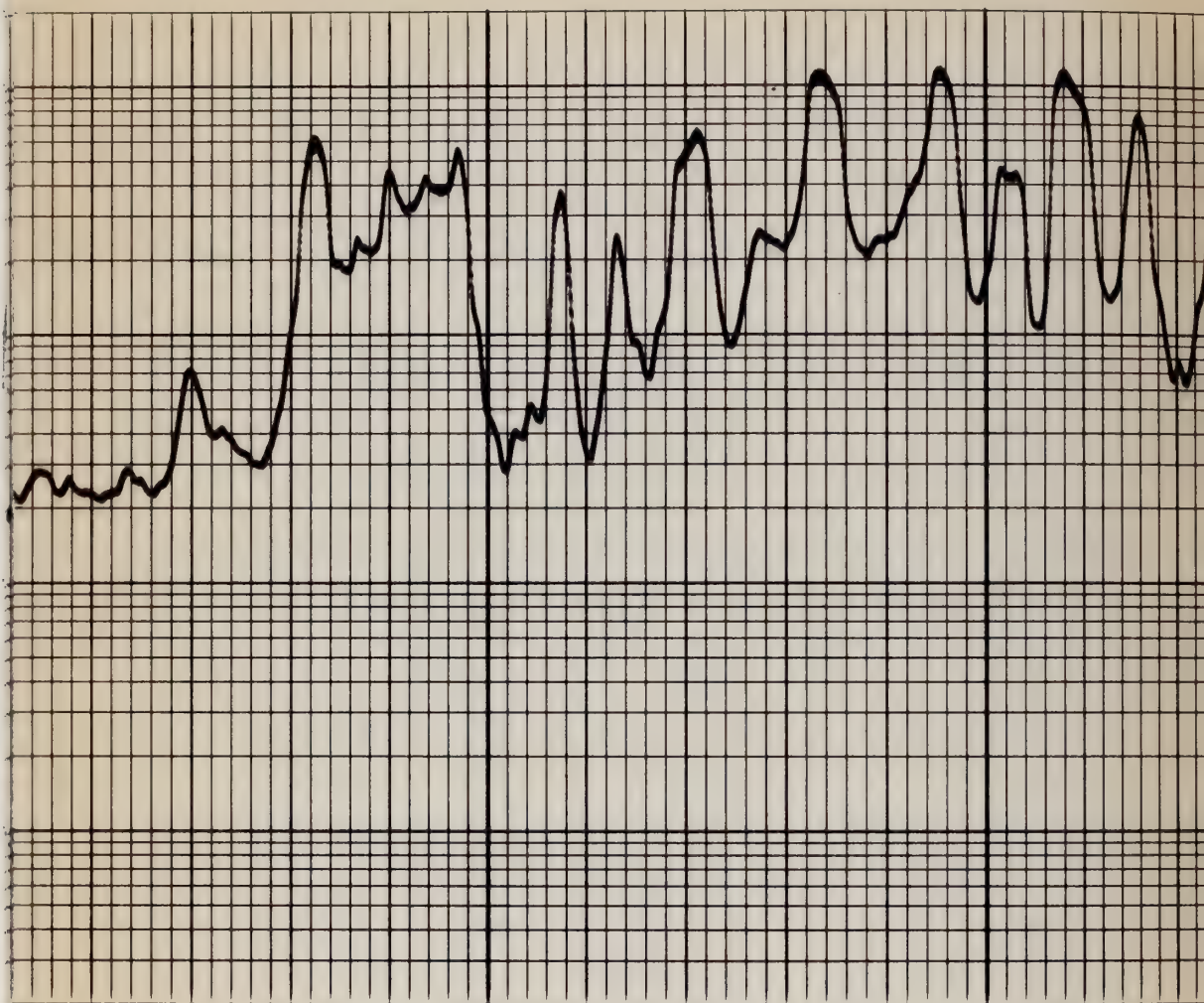
0500



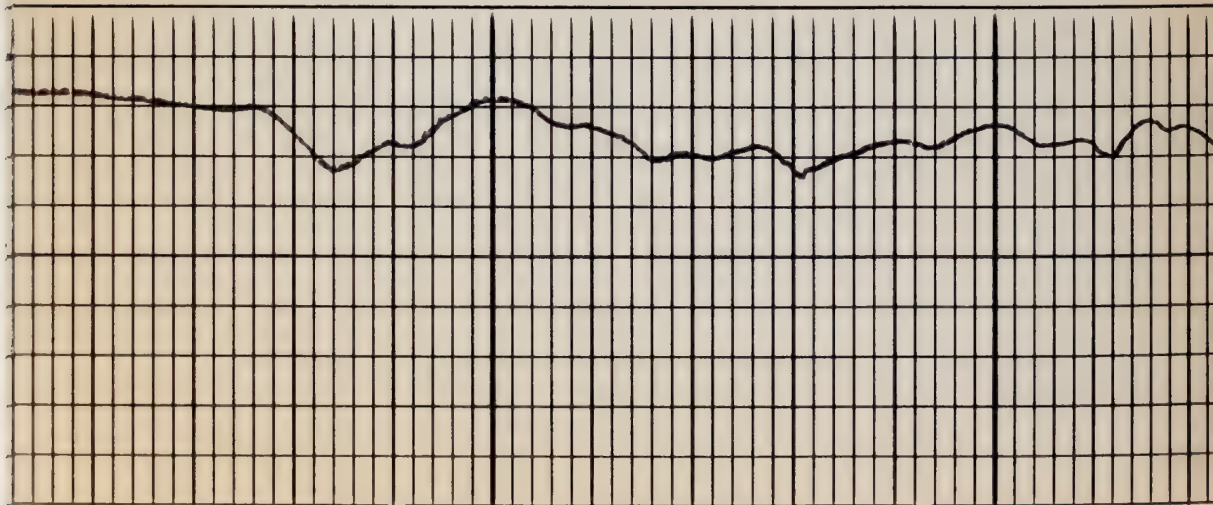


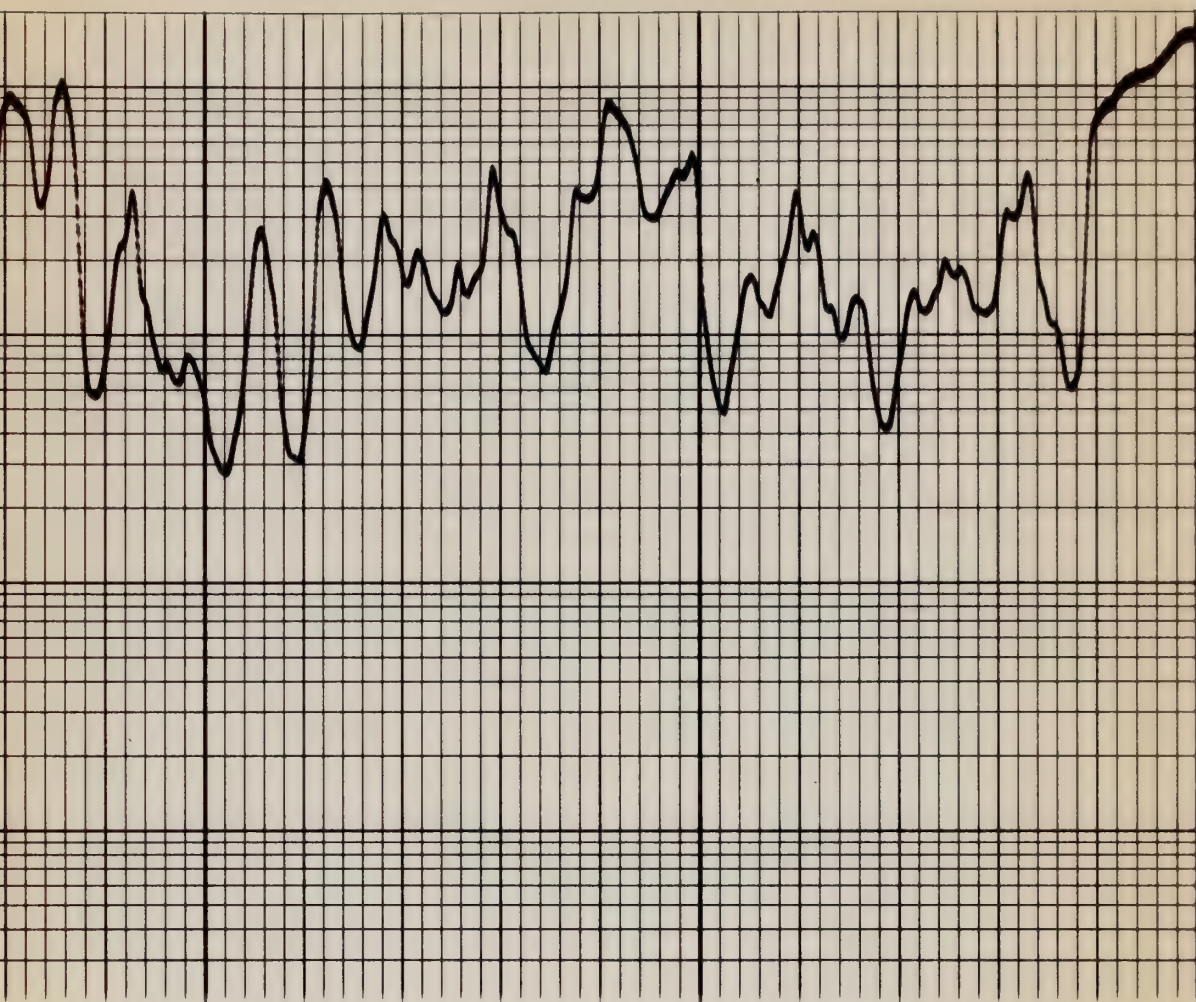
0600





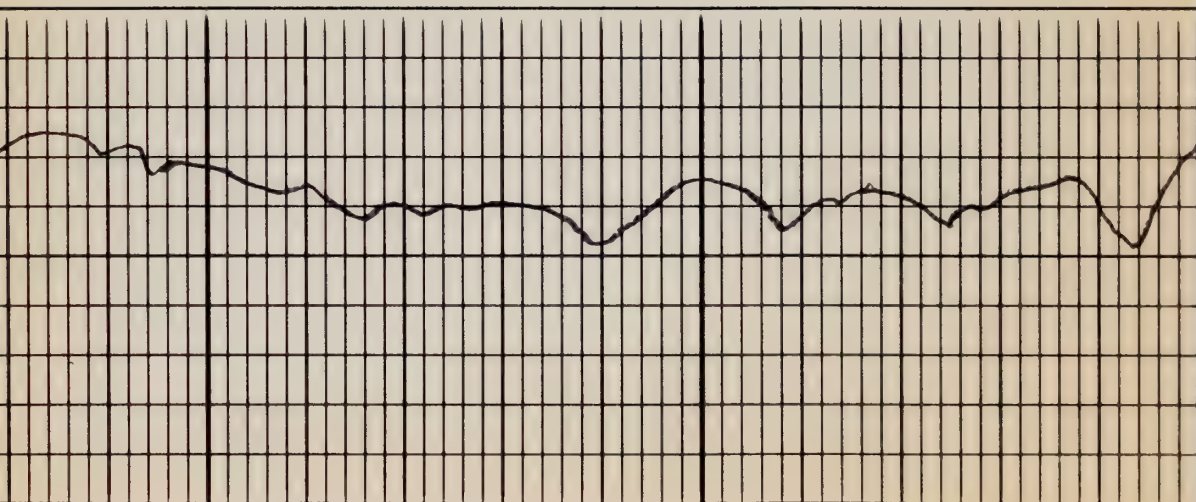
0700

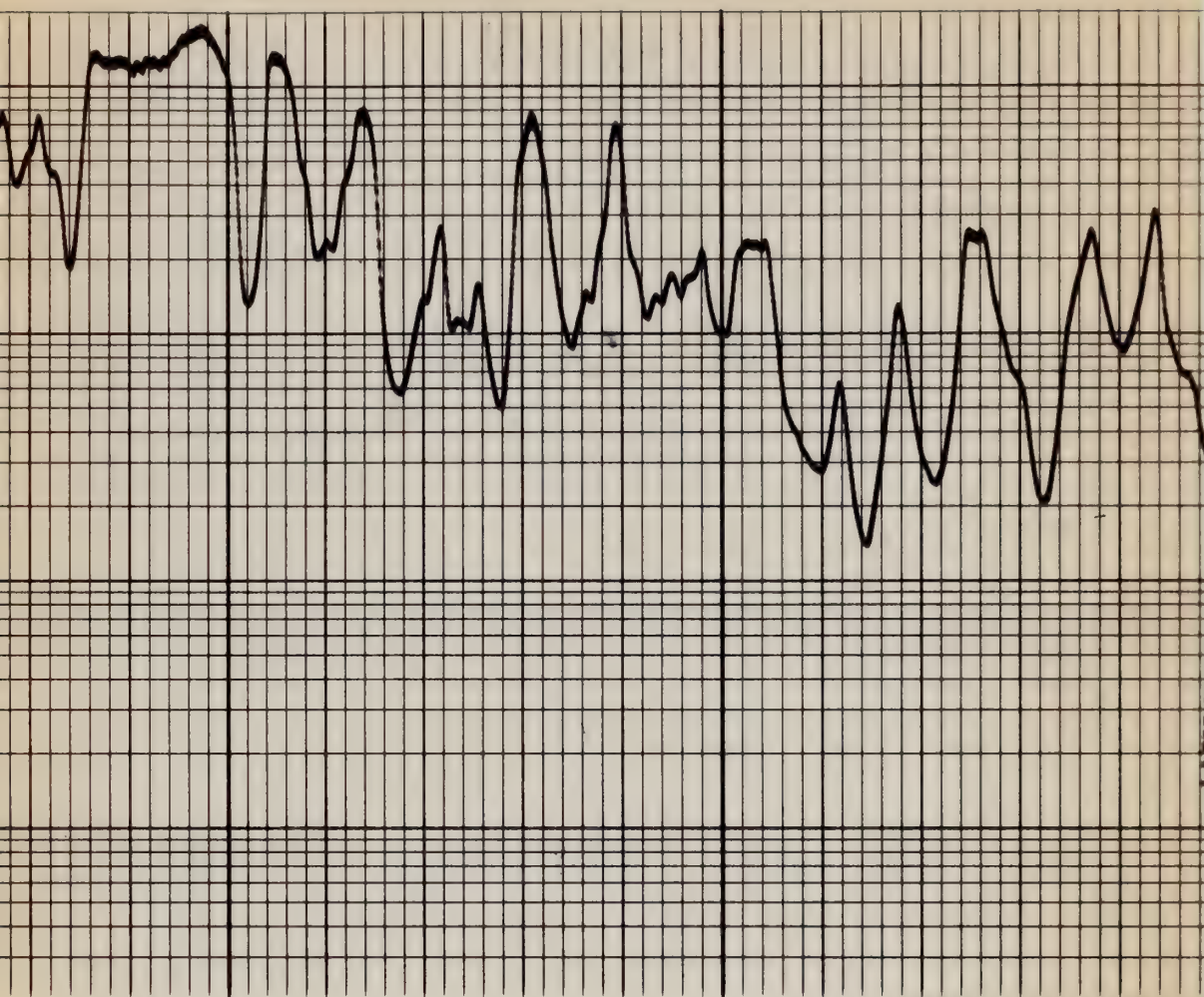




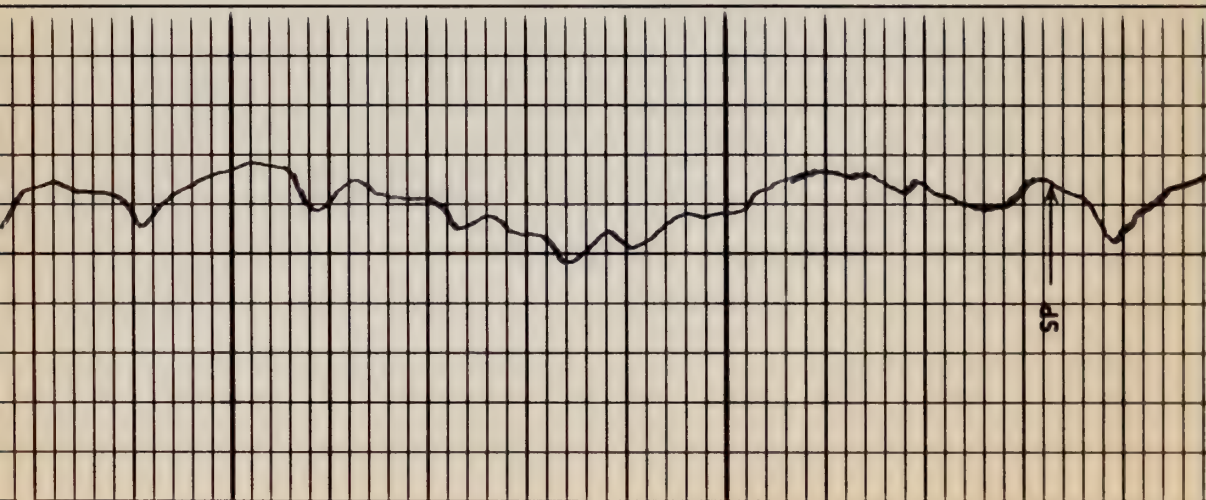
0800

09

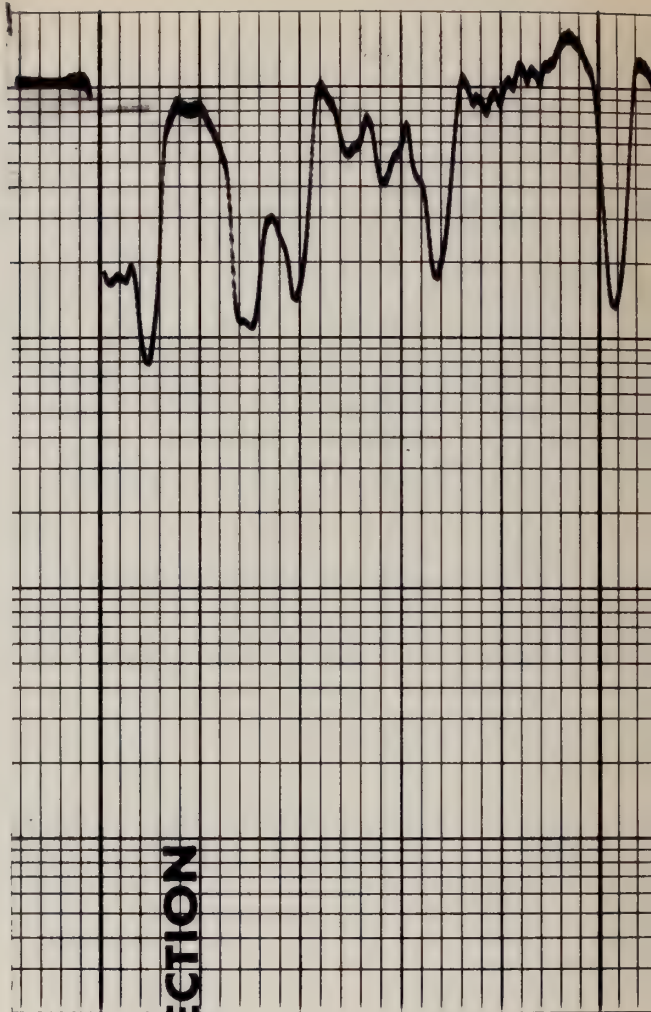
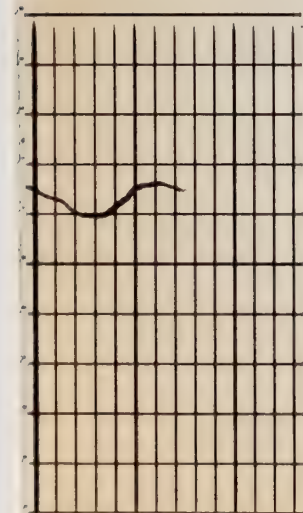
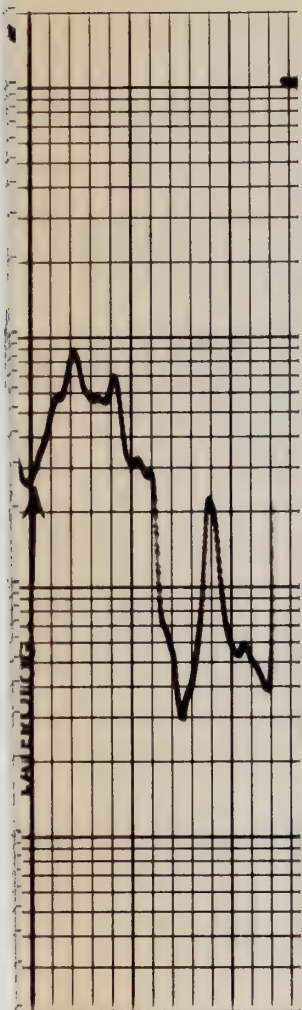




1100

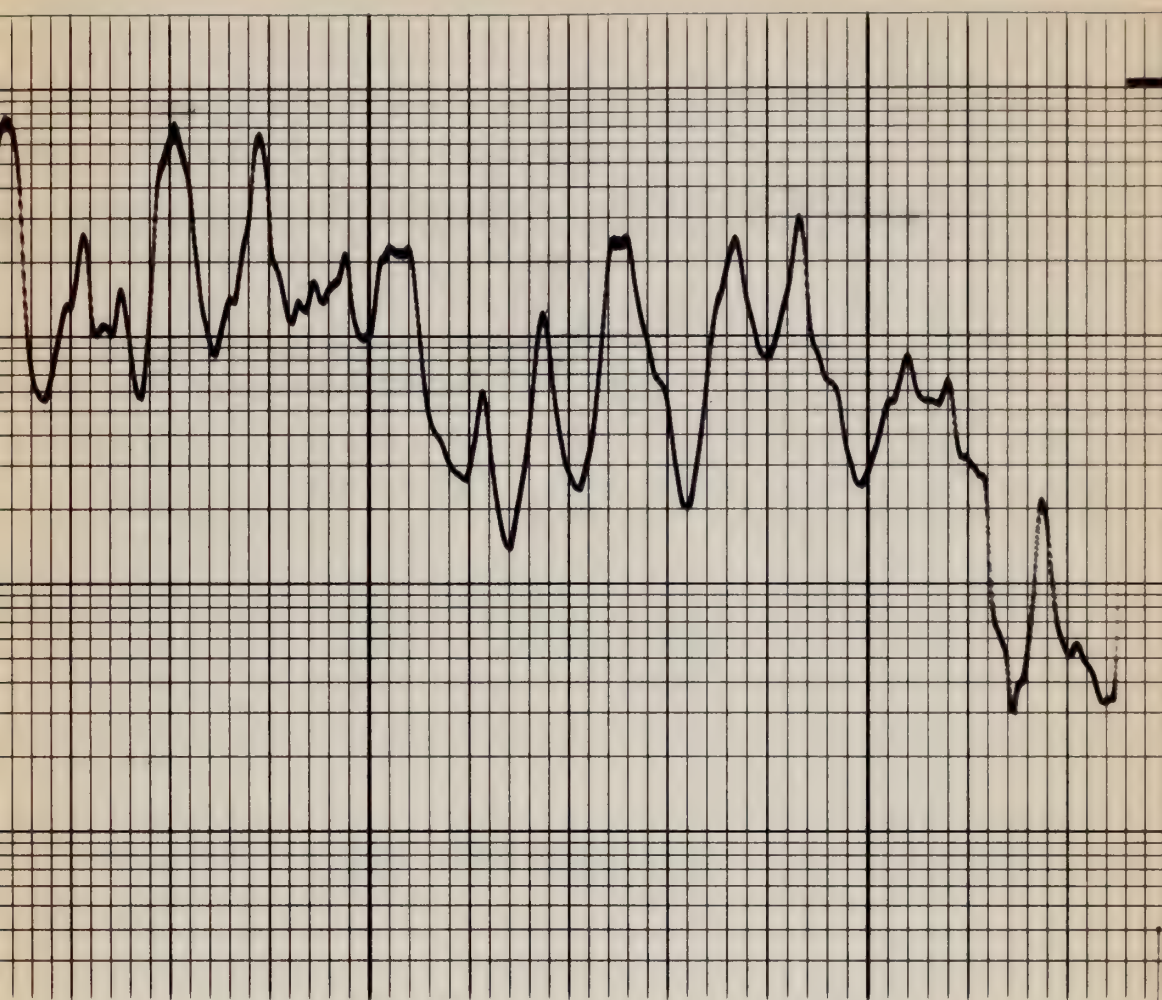


AS

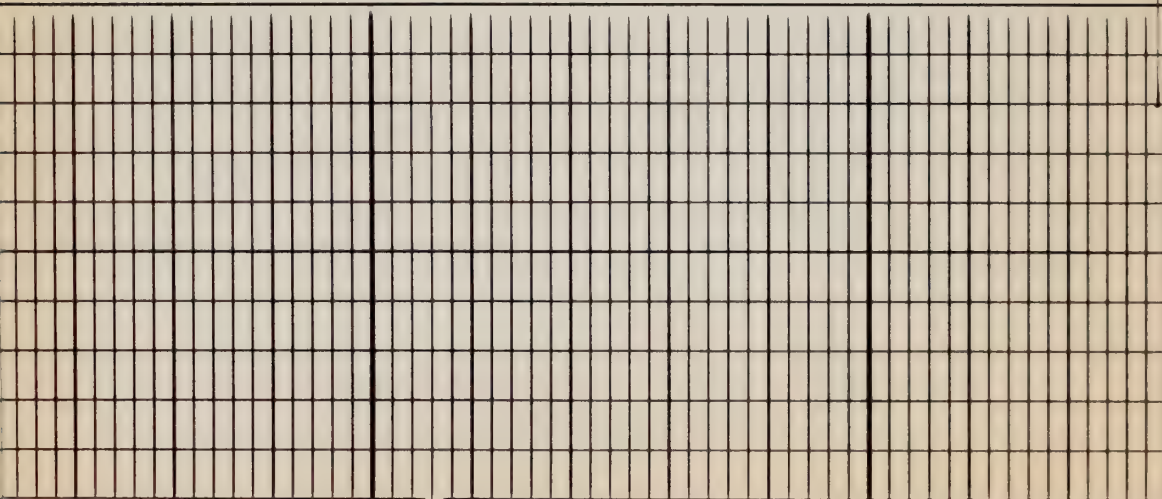


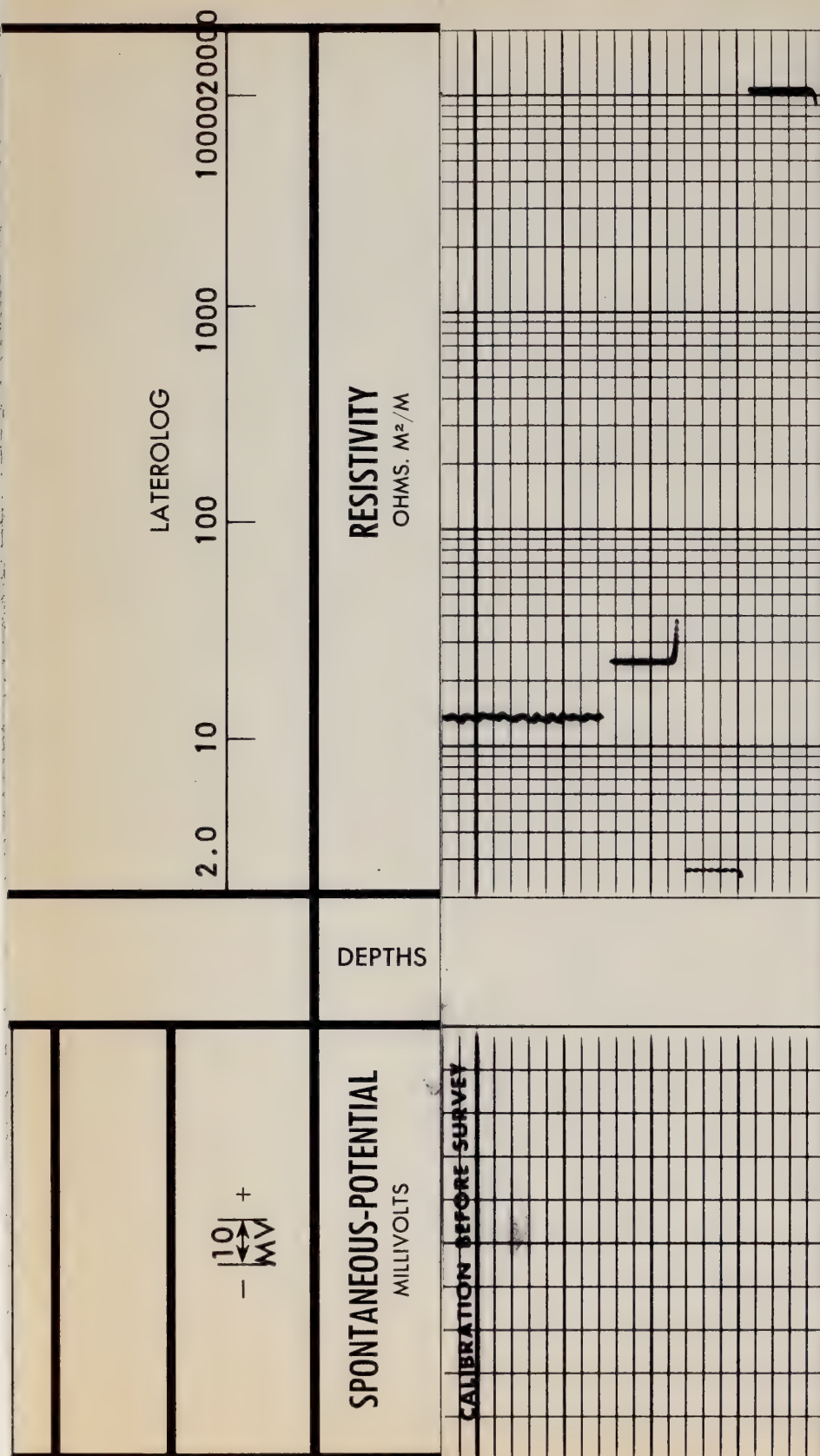
1000

REPEAT SECTION



1100





COMPANY	ATLANTIC RICHFIELD COMPANY
WELL	SORGHUM GULCH 1-A
FIELD	SORGHUM GULCH
SCHL. FR	1179
SCHL. TD	1182
DRLR TD	1180
Elev:	KB _____ DF _____

Schlumberger**BOREHOLE COMPENSATED
SONIC LOG - GAMMA RAY**

(WITH CALIPER)

<div>COUNTY</div> <div>FIELD or</div> <div>LOCATION</div> <div>WELL</div> <div>COMPANY</div>	RIO BLANCO	ATLANTIC RICHFIELD COMPANY									
	SORGHUM GULCH	ATLANTIC RICHFIELD									
	SORGHUM GULCH 1-A										
COMPANY ATLANTIC RICHFIELD COMPANY		WELL SORGHUM GULCH 1-A									
FIELD SORGHUM GULCH		COUNTY RIO BLANCO				STATE COLORADO					
Location:						Other Services:					
Sec. 2 Twp. 3S Rge. 97W						TEMP. FDC-GR AMP-VDL, LL-7					
Permanent Datum: GL ; Elev.: _____						Elev.: K.B. _____					
Log Measured From GL , 0 Ft. Above Perm. Datum						D.F. _____					
Drilling Measured From GL						G.L. _____					
Date	2-1-75										
Run No.	ONE										
Depth-Driller	1180										
Depth-Logger	1182										
Btm. Log Interval	1180										
Top Log Interval	230										
Casing-Driller	7 @ 230					@		@		@	
Casing-Logger	230										
Bit Size	6-1/4										
Type Fluid in Hole	FORMATION FLUID										
Fluid Level	Z 150										
Dens.	Visc.										
pH	Fluid Los		ml		ml		ml		ml		
Source of Sample											
Rm @ Meas. Temp.	@	°F	@	°F	@	°F	@	°F			
Rmf @ Meas. Temp.	@	°F	@	°F	@	°F	@	°F			
Rmc @ Meas. Temp.	@	°F	@	°F	@	°F	@	°F			
Source: Rmf	Rmc										
Rm @ BHT	@	°F	@	°F	@	°F	@	°F			
Time Since Circ.											
Max. Rec. Temp. °F °F °F °F											
Equip.	Location	5602 GJ									
Recorded By		GEIGER									
Witnessed By		POWERS									

The well name, location and borehole reference data were furnished by the customer

FOLD HERE

[illegible]

GAMMA RAY:

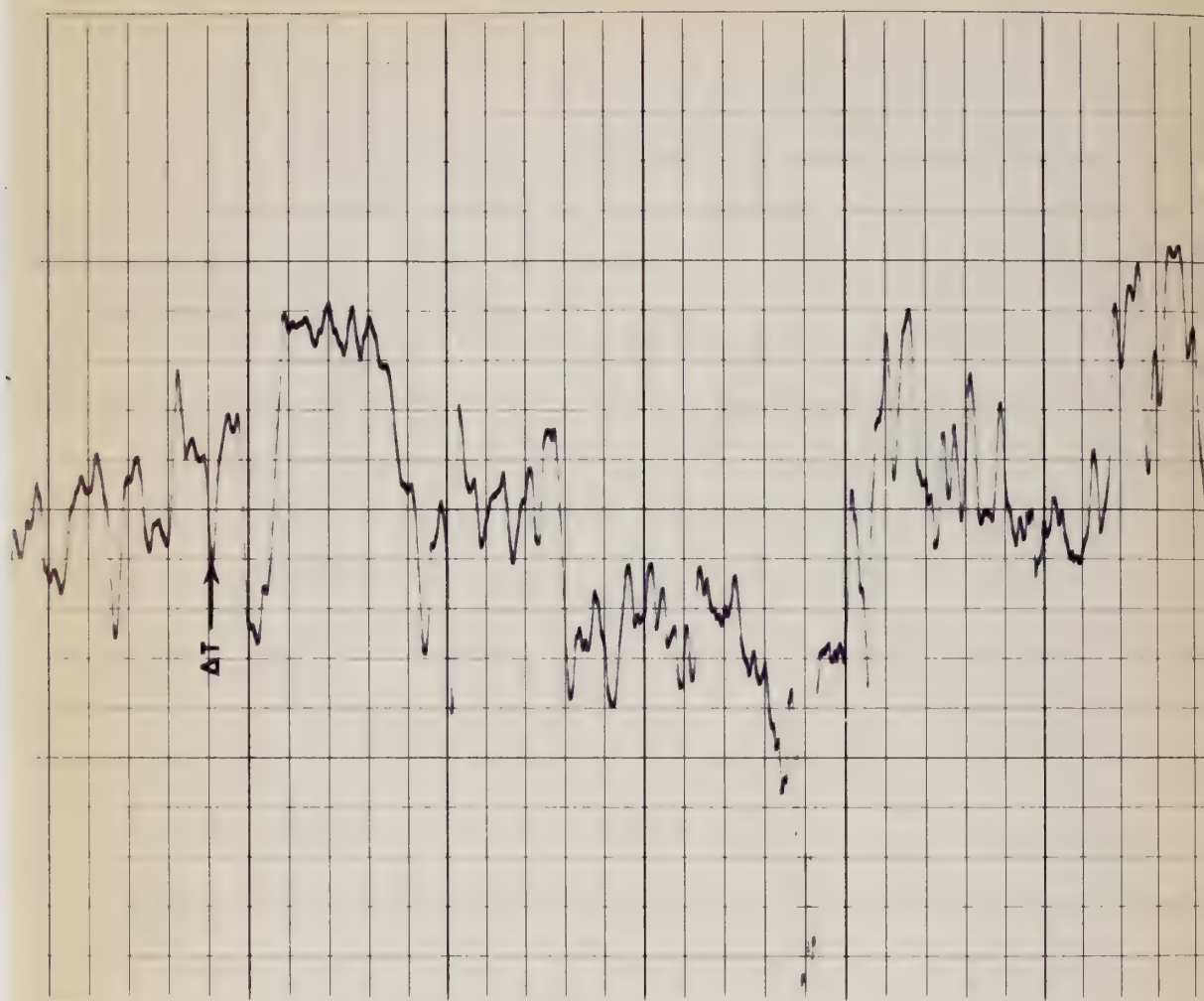
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

INTERVAL TRANSIT TIME MICROSECONDS PER FOOT		DEPTHS	
T $\frac{3}{2}$ R ₁ 2 R ₂			
150	100		
	200		
150			

GAMMA

15

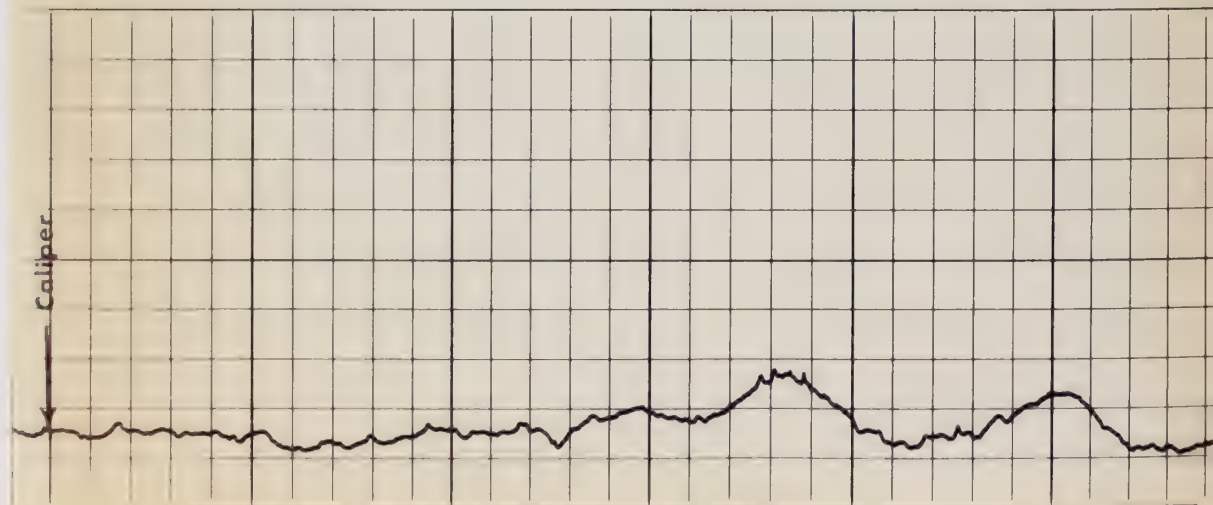
Casing

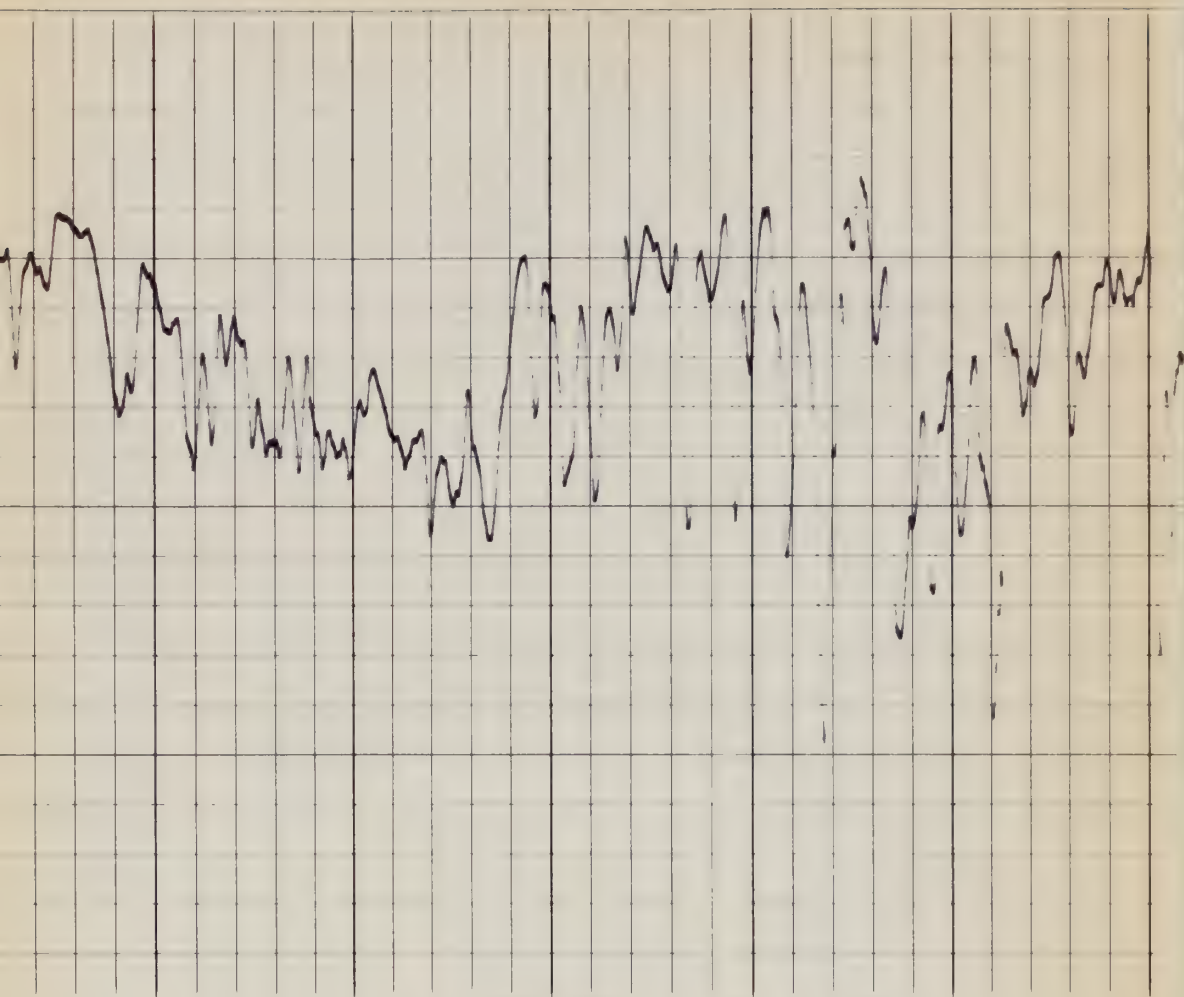


0300

0400

0500



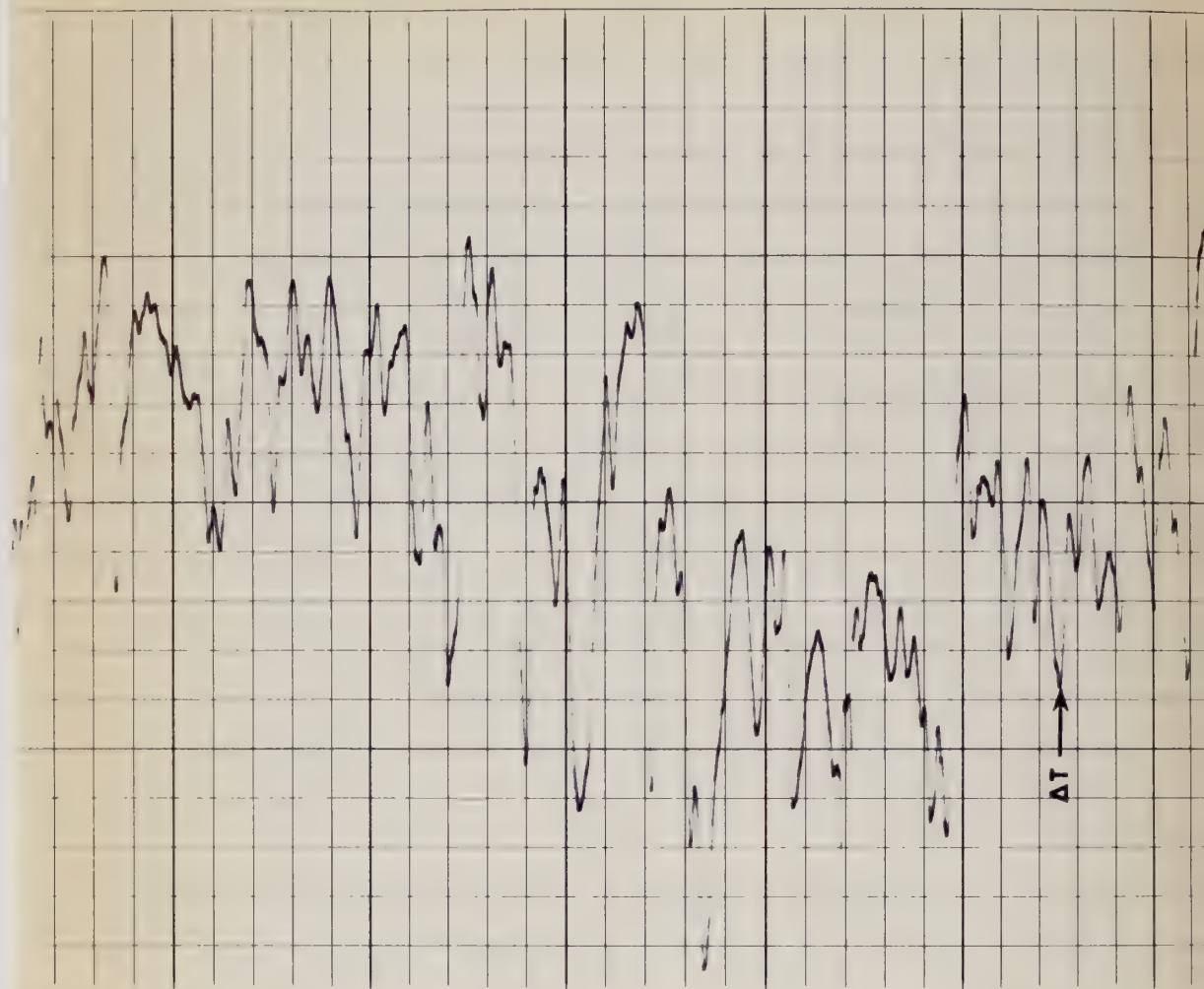


0600

0700

0800

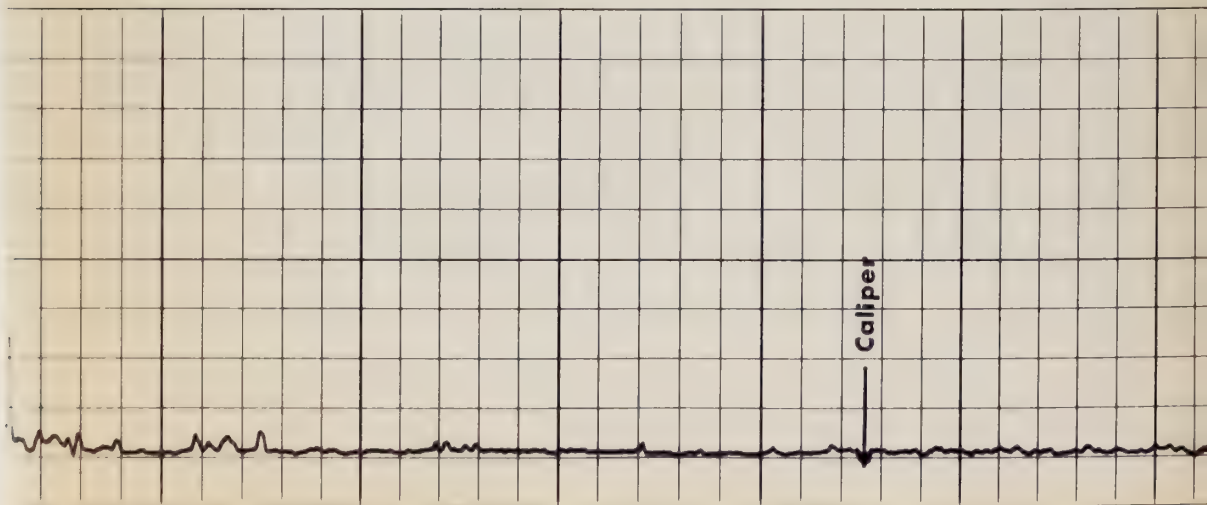




0900

1000

1100



DETAIL LOG

5" = 100'

CALIPER DIAM. IN INCHES

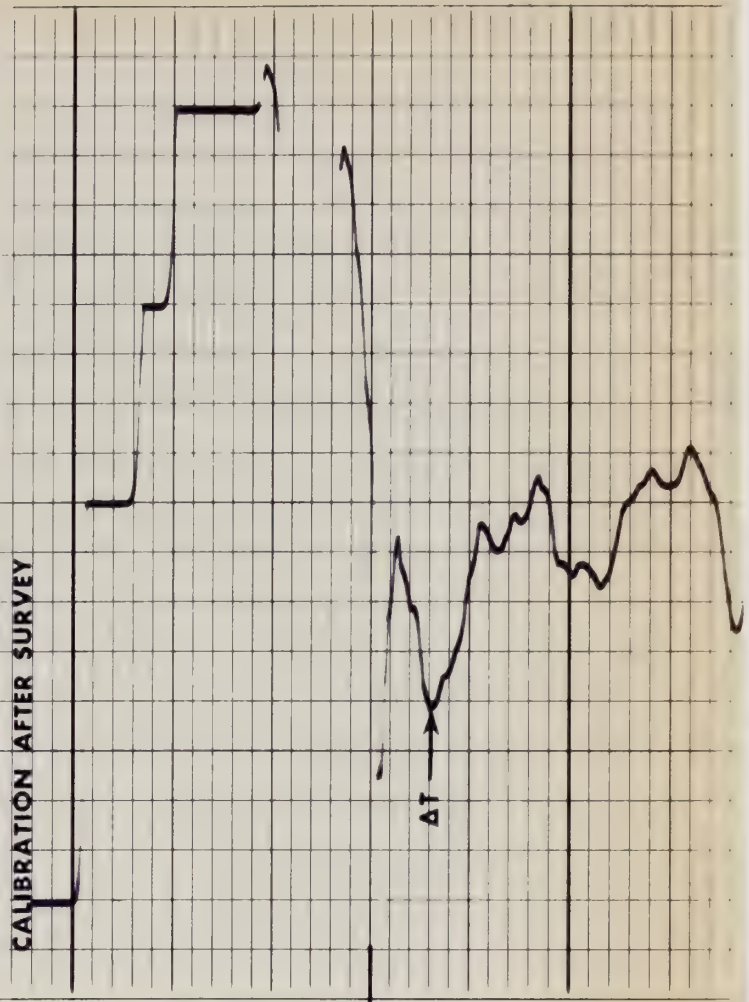
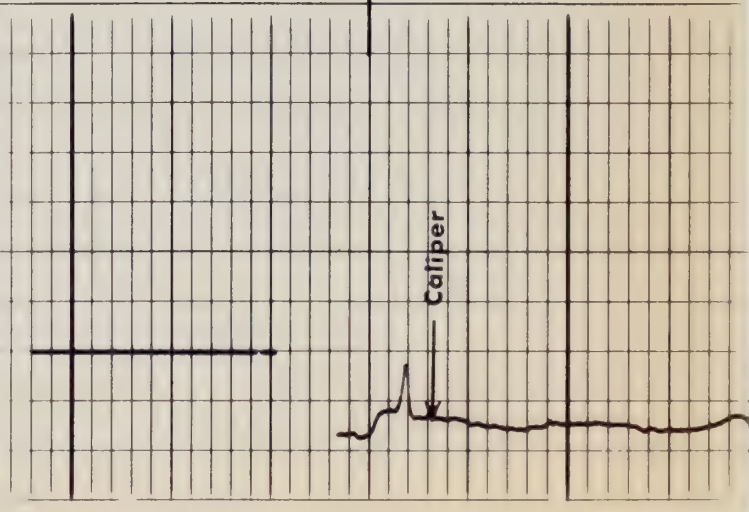
5 15

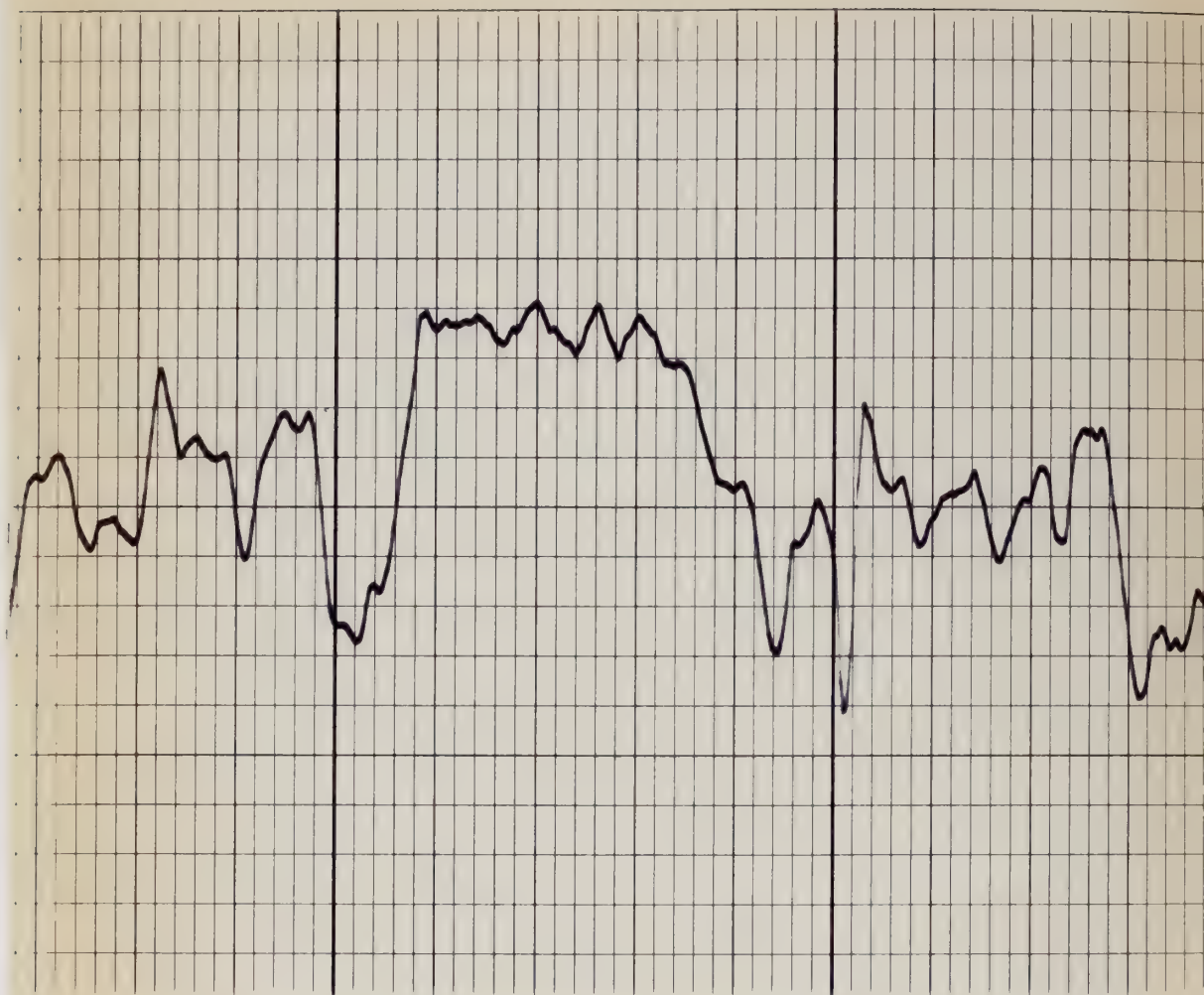
DEPTH

INTERVAL TRANSIT TIME MICROSECONDS PER FOOT T 3 R₁ 2 R₂

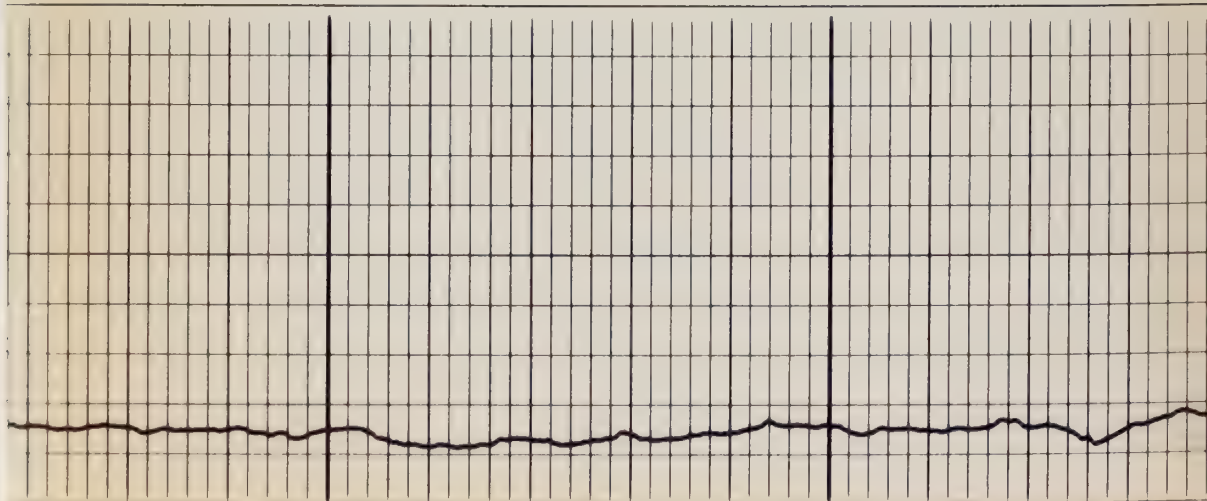
150 100 50

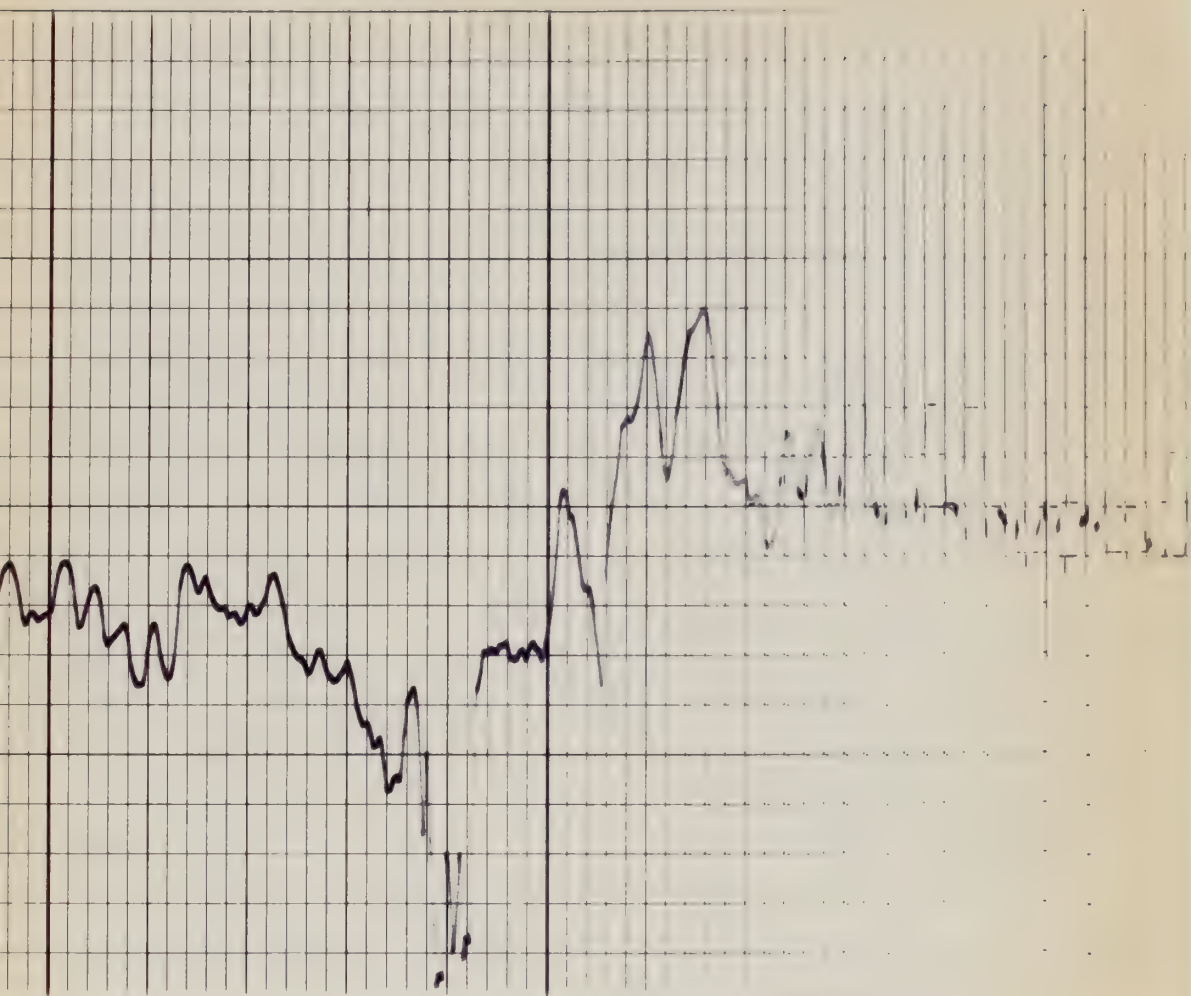
200 150



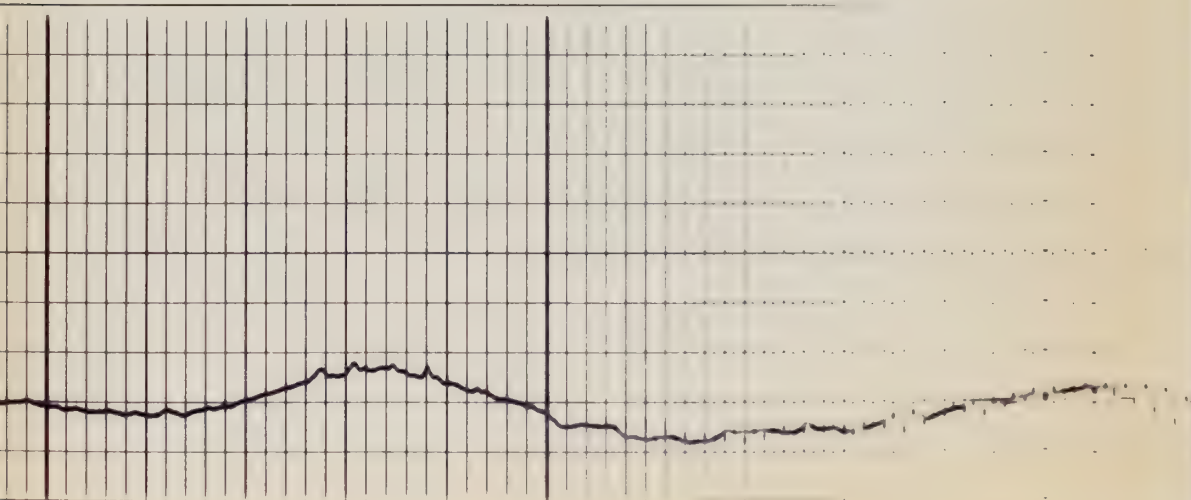


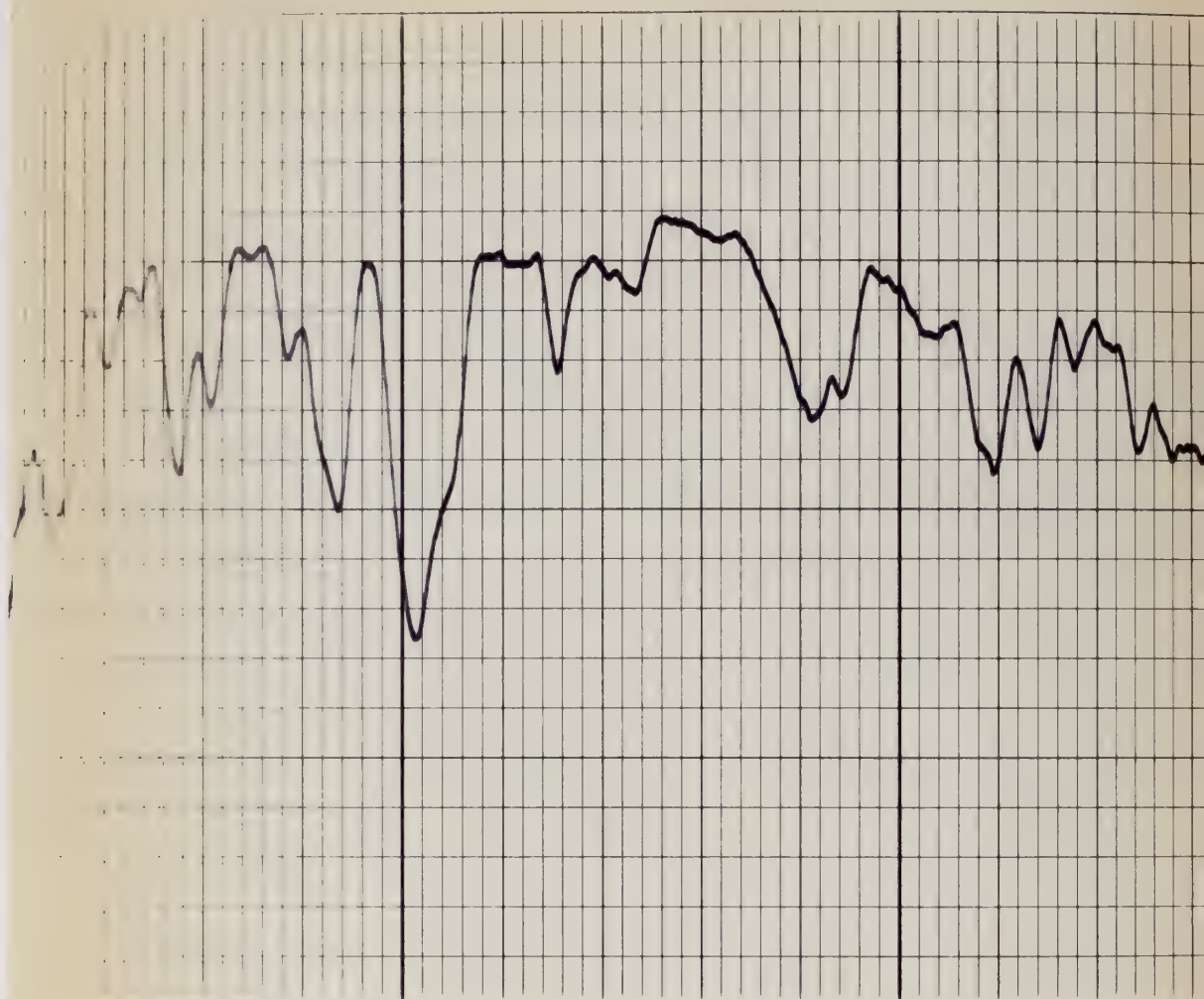
0300



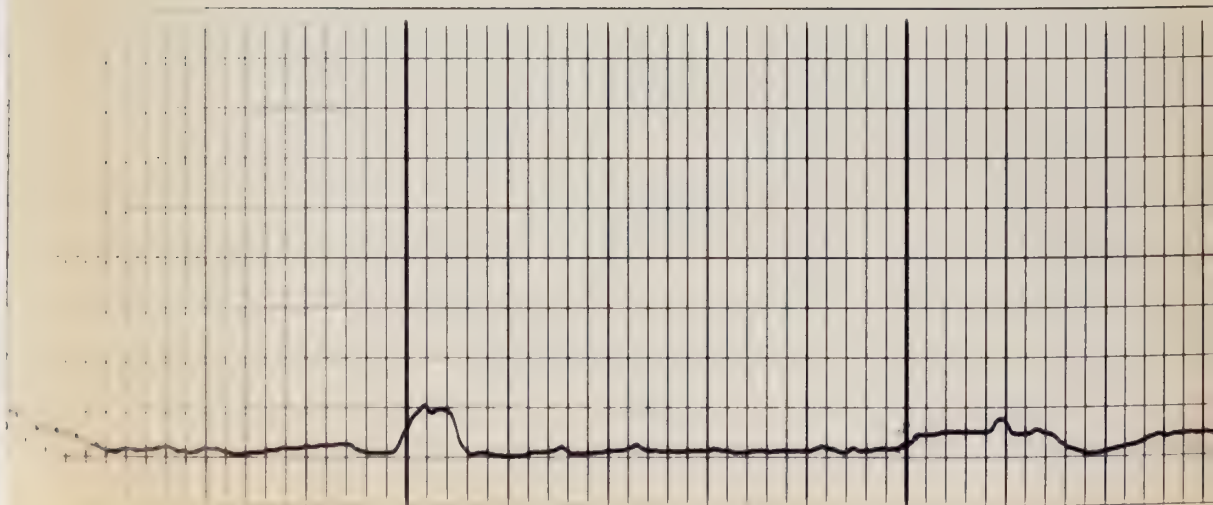


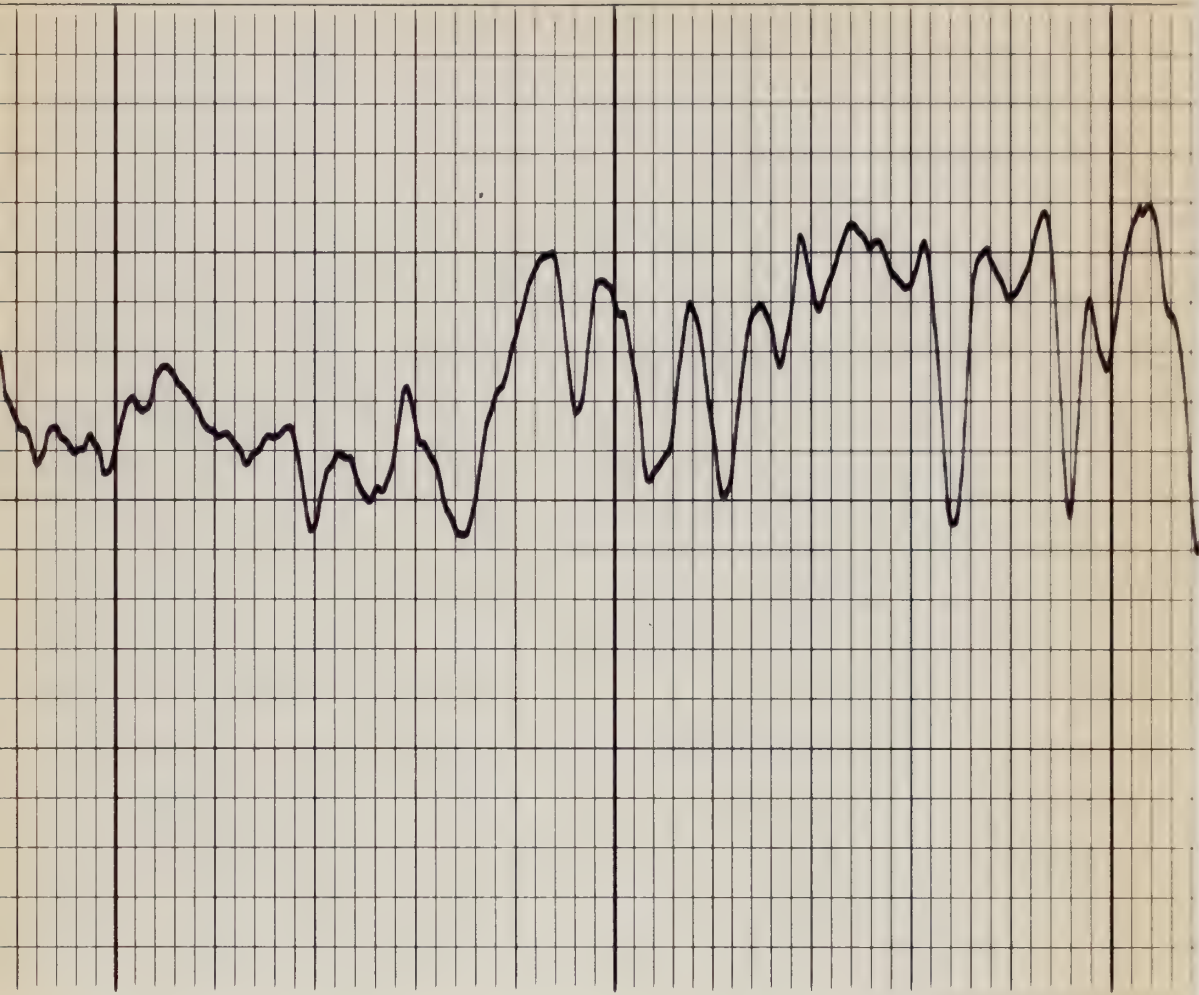
0400



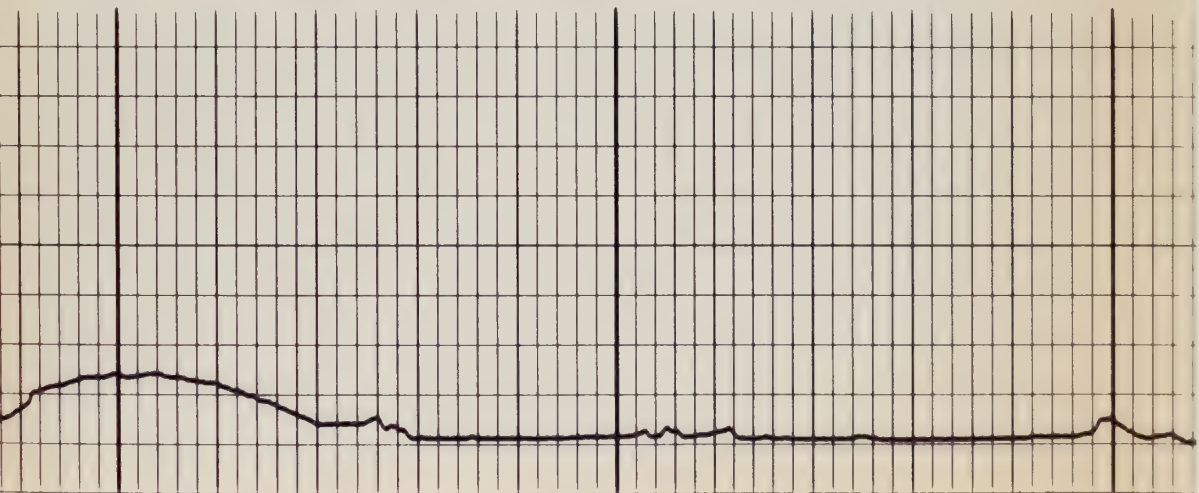


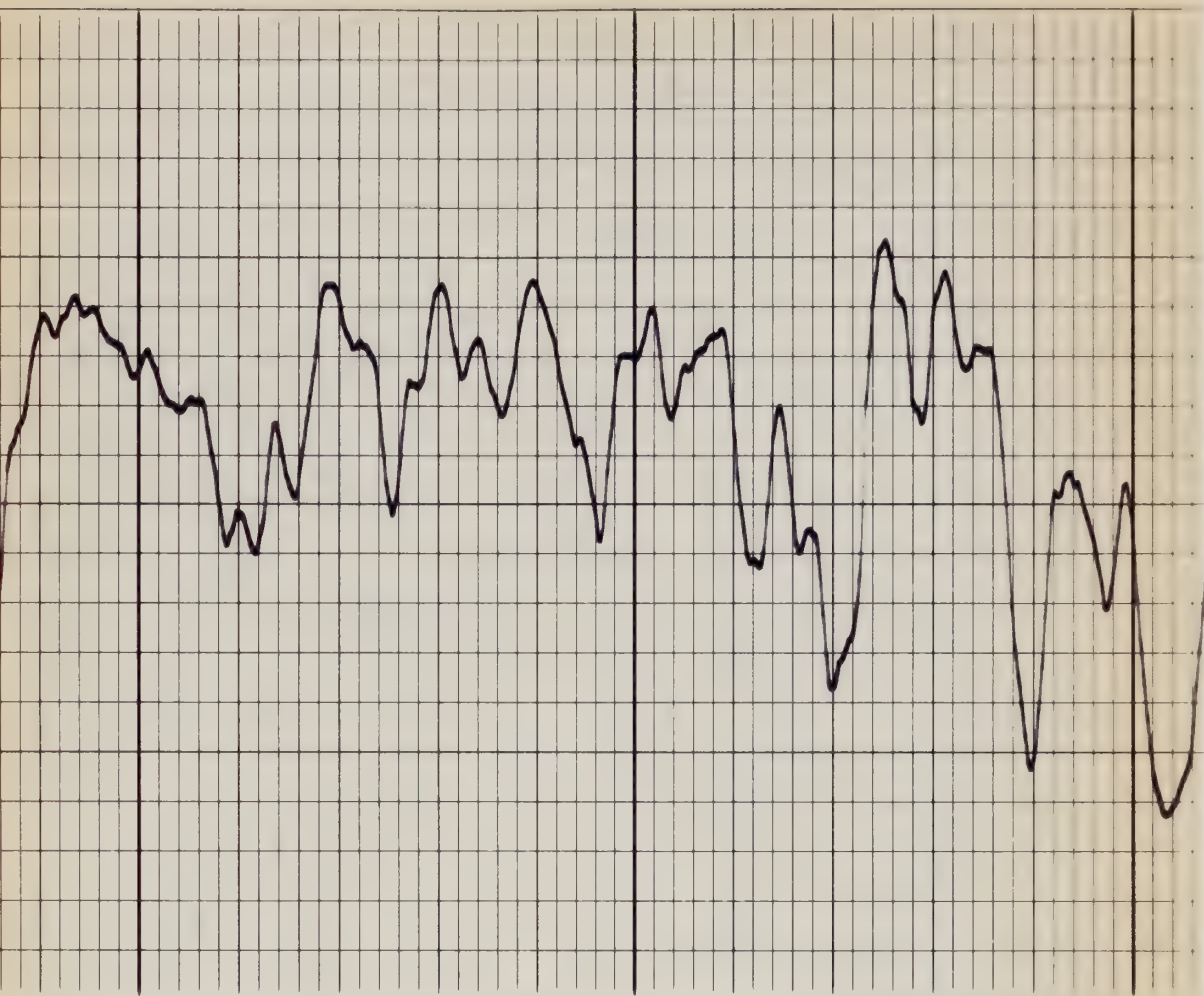
0600





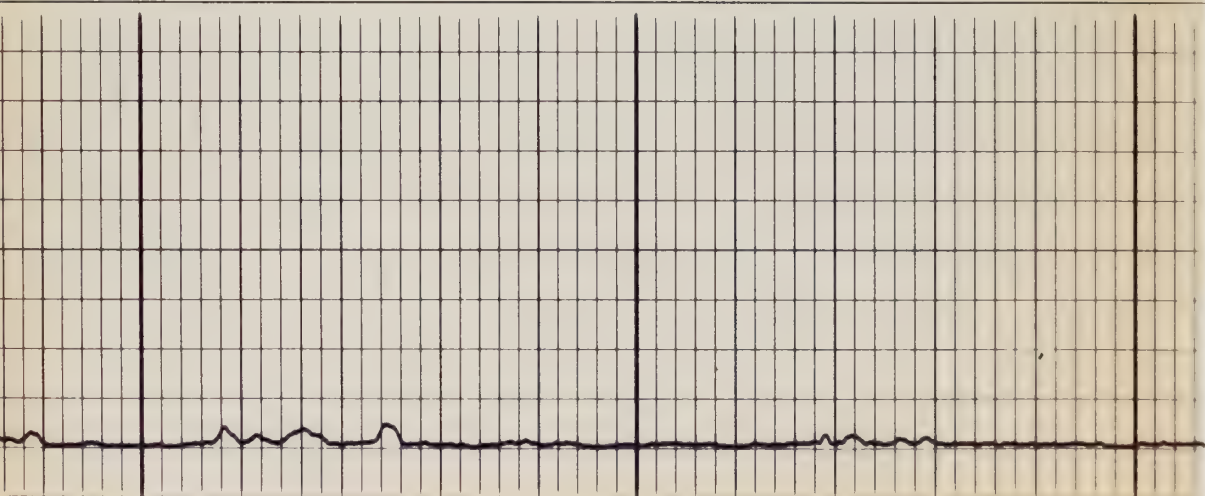
0700

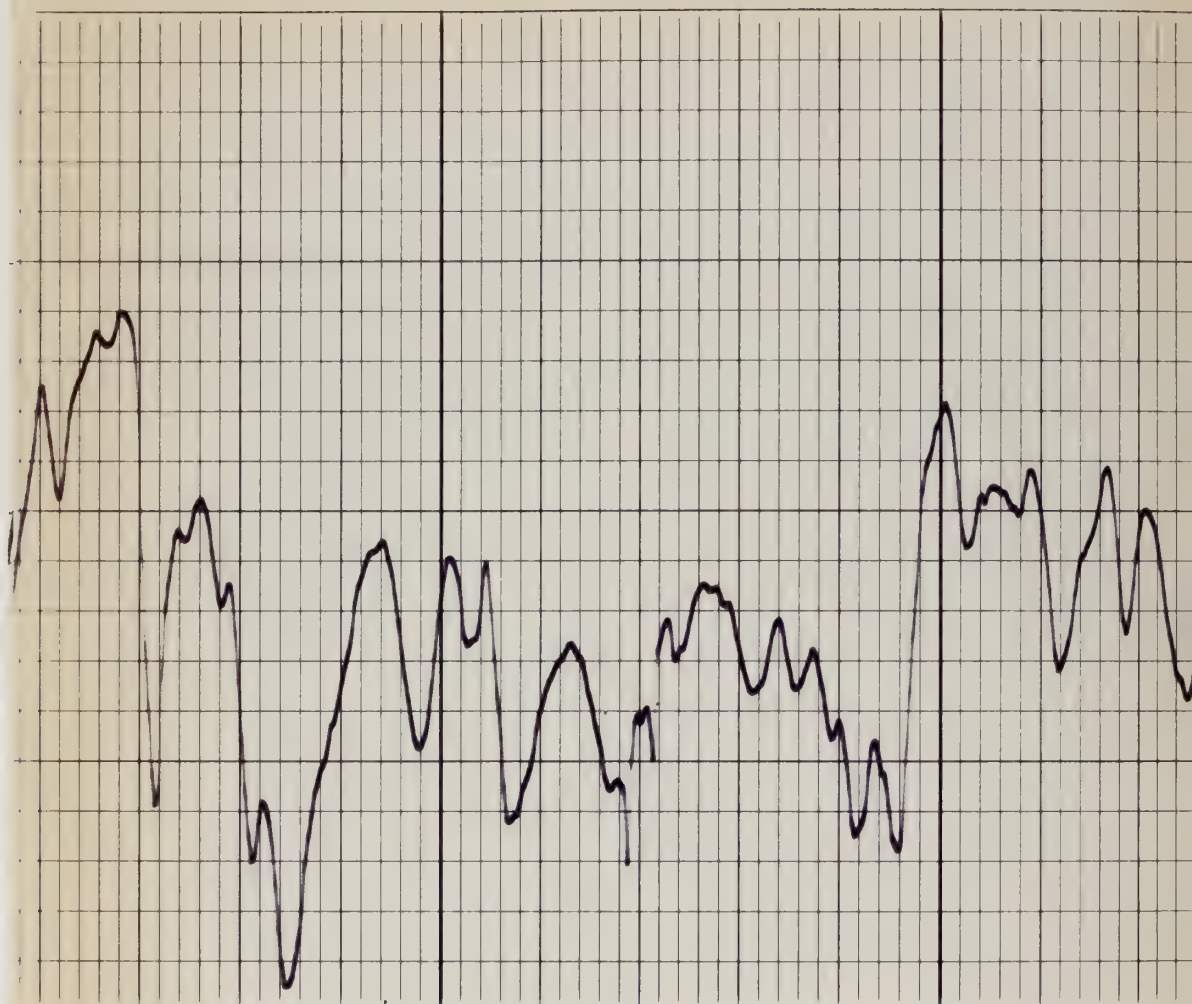




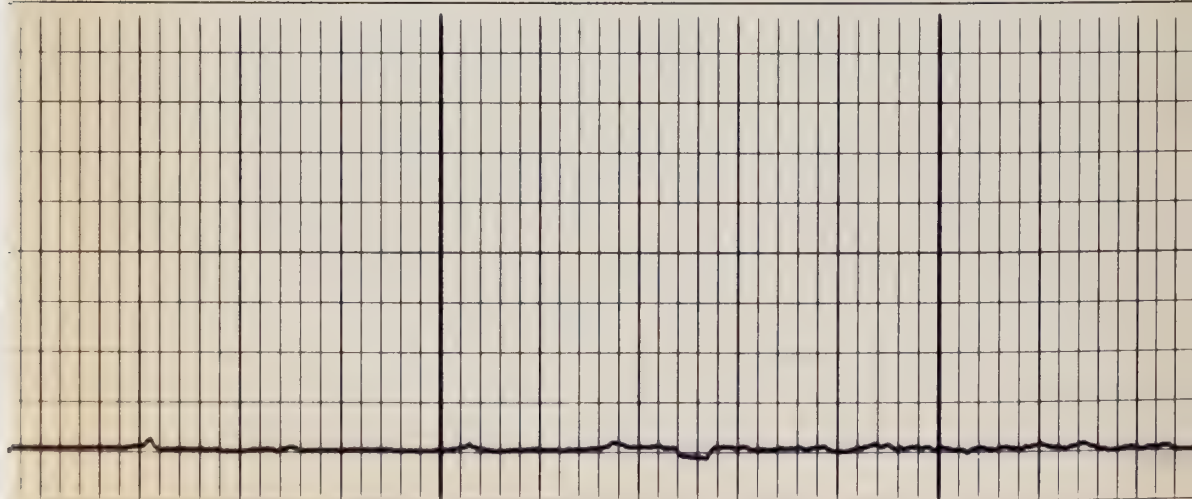
0900

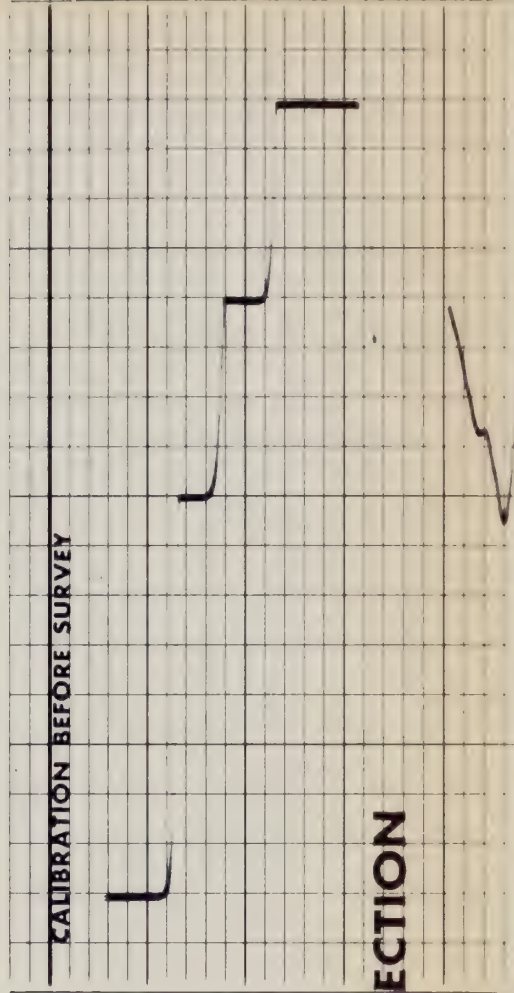
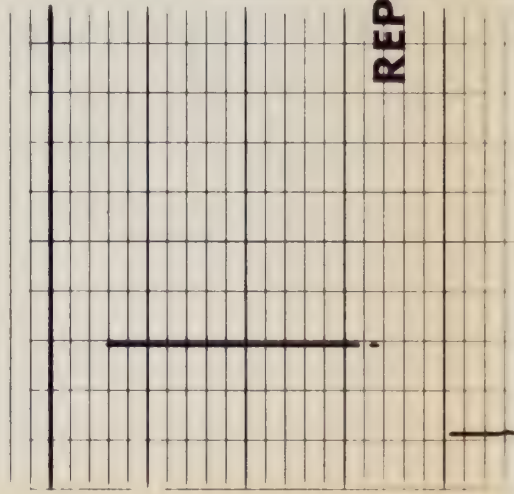
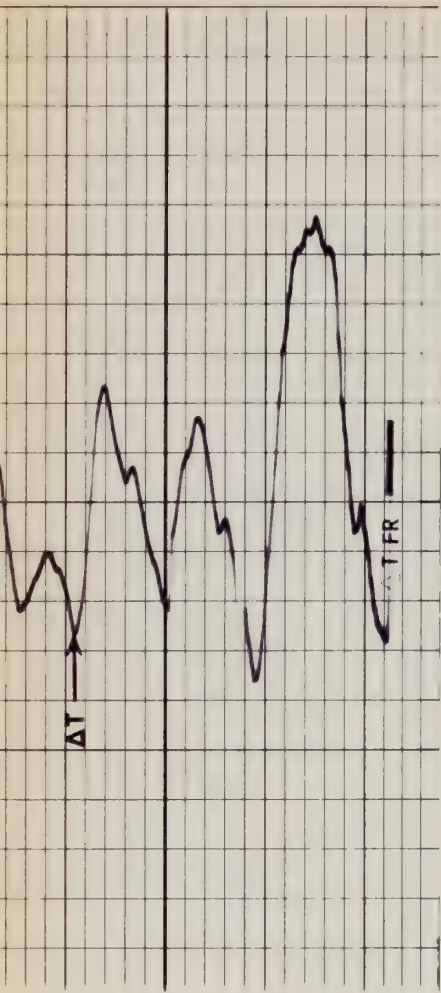
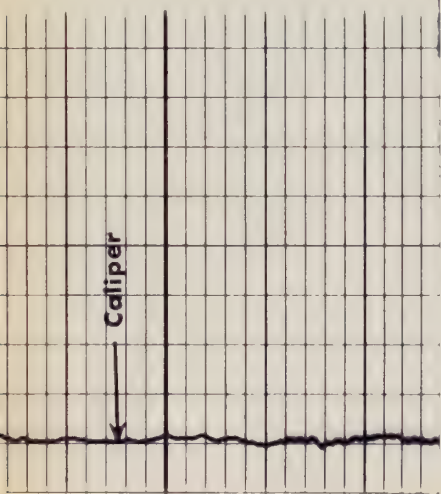
1000





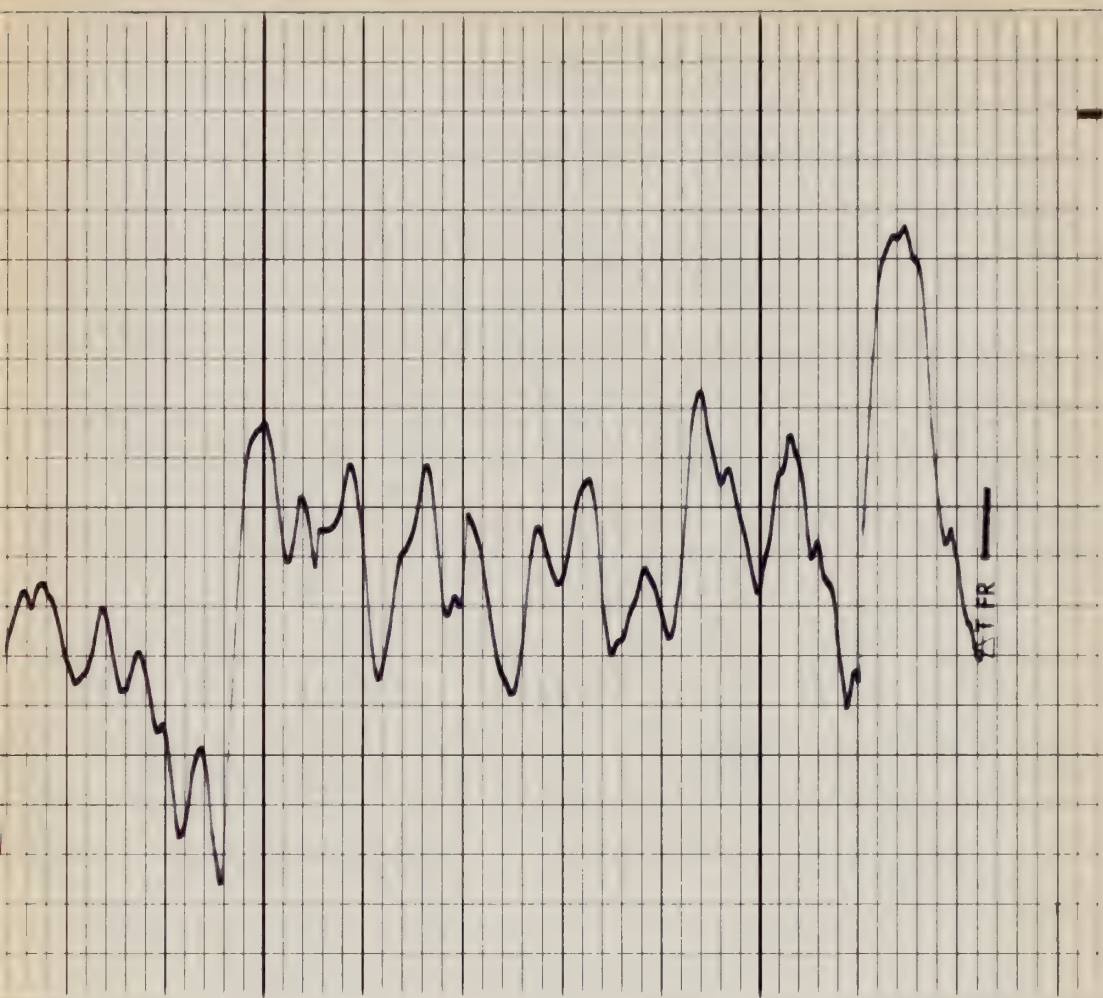
1100



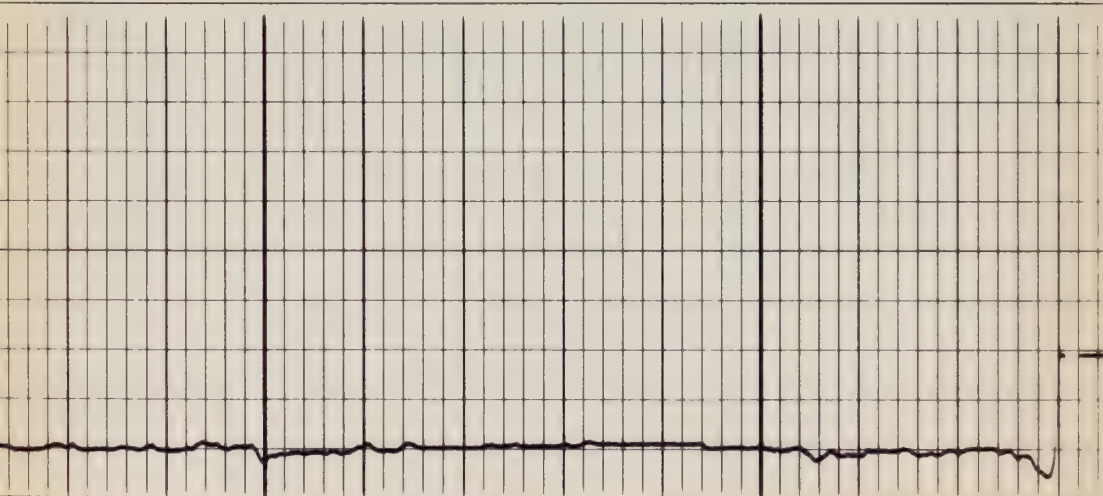


CALIBRATION BEFORE SURVEY

REPEAT SECTION



1100



CALIPER DIAM. IN INCHES 5 _____ 15 _____	DEPTH _____	INTERVAL TRANSIT TIME 150 _____	MICROSECONDS PER FOOT 100 _____	T <u>3</u> R <u>1</u> R <u>2</u> 50 _____
		200 _____	150 _____	

BOREHOLE COMPENSATED SONIC CALIBRATION CODING

1. MECHANICAL ZERO
2. 40 μ SEC/FT
3. 60 μ SEC FT
4. 80 μ SEC FT
5. 100 μ SEC FT
6. 140 μ SEC FT

← CALIBRATION RECORD

COMPANY	ATLANTIC RICHFIELD COMPANY	SCHL. FR	1180
WELL	SORGHUM GULCH 1-A	SCHL. TD	1182
FIELD	SORGHUM GULCH	DRLR TD	1180
COUNTY	RIO BLANCO	Elev:	KB _____
			DF _____
			GL _____

Schlumberger**COMPENSATED
FORMATION DENSITY LOG**
Gamma-GammaCOMPANY ATLANTIC RICHFIELD COMPANYWELL SORGHUM GULCH 1-AFIELD SORGHUM GULCHCOUNTY RIO BLANCO STATE COLORADO

Location: API Serial No. _____

Sec. 2 Twp. 3S Rge. 97W

Other Services:

BHC
TEMP
LL-7 AMP.Permanent Datum: GL; Elev.: _____
Log Measured From GL, _____ Ft. Above Perm. Datum
Drilling Measured From GLElev.: K.B. _____
D.F. _____
G.L. _____

Date	1/20/75	2-1-75		
Run No.	ONE	TWO		
Depth—Driller	938	1180		
Depth—Logger	938	1182		
Btm. Log Interval	937	1181		
Top Log Interval	80	700		
Casing—Driller	7" @ 225	7 @ 225	@	@
Casing—Logger	230	230		
Bit Size	6-1/4	6-1/4		
Type Fluid in Hole	WATER	FORMATION WATER		
Fluid Level	150'	200		
Dens.	Visc.			
pH	Fluid Los	ml	ml	ml
Source of Sample	PIT			
Rm @ Meas. Temp.	7.6 @ 61 °F	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: Rmf	Rmc			
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.		5. MS.		
Max. Rec. Temp.	6 °F	97 °F	°F	°F
Equip.	Location	5602 G. J.	5602 GJ	
Recorded By	GEIGER	GEIGER		
Witnessed By	BURNS	POWERS		

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date	Sample No.		
Depth - Driller			
Type Fluid			
Source of Sample			
R _m @ Meas. Temp.	@	°F	@
R _{mf} @ Meas. Temp.	@	°F	@
R _{mc} @ Meas. Temp.	@	°F	@
R _m @ BHT	@	°F	@
Dens.	Visc.		
ph	Fluid Loss	ml	ml
°O	Water by Vol.		
°O	Oil by Vol.		
°O	Solids by Vol.		
Solids Av. Sp. Gr.			

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

LOGGING DATA

FDC Selectors				
Liquid Density	Grain Density	Hole Fluid	Porosity Scale	To

REMARKS

Service Order No. - 22497

ELEVATION AND EXACT LOCATION WERE
NOT AVAILABLE AT TIME OF LOGGING.RUN TWO: NO HOLE FLUID AVAILABLE
FOR SAMPLE

EQUIPMENT DATA

Run No.	ONE	TWO	
Panel No.	169	169	
Cart No.	299	299	
Skid No.	436	436	
Sonde No.	90	90	
Source	3098	3098	
Calibrator	210	210	
GR Cart.	209	289	
TTR			
Mem Panel	235	238	

BIT SIZE / CASING DATA

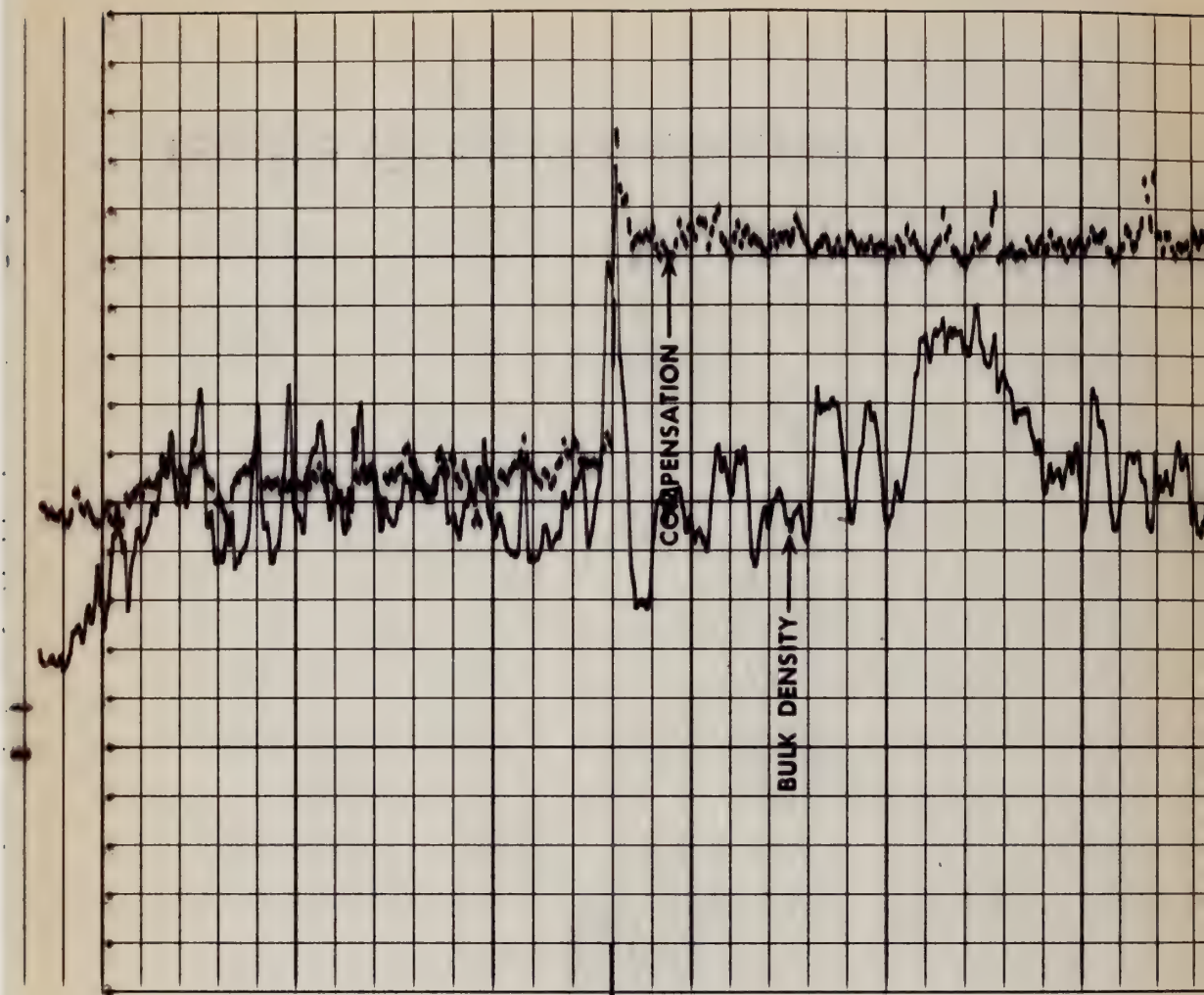
Bit	From	To	Csg. Size	Csg. Wt.	From	To
6-	150	938	7"	20#	SURF	225
1/4						
6-						
1/4	230	1180	7"		SURF	230

CALIBRATION DATA

Run No.	Gamma Ray			FDC — Before Log — ACPS		FDC — After Log — ACPS	
	API Scale	Background CPS	Total CPS	P ₁	P ₂	P ₁	P ₂
1	0-200	150	610	550	930	545	930
2	0-200	160	630	550	925	550	925
3							
4				BLOCK CAL	560	940	

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

CALIPER		DEPTHS	
HOLE DIAM. IN INCHES			
<div> <div>5</div> <div>15</div> </div>		<div> <div>-.25</div> <div>0</div> <div>+.25</div> </div>	
		CORRECTION GRAMS/CC.	
		BULK DENSITY GRAMS /CC.	
0	150	1.7	2.2
150	300	.7	1.2
		1.7	
		1.7	
		RUN 1	

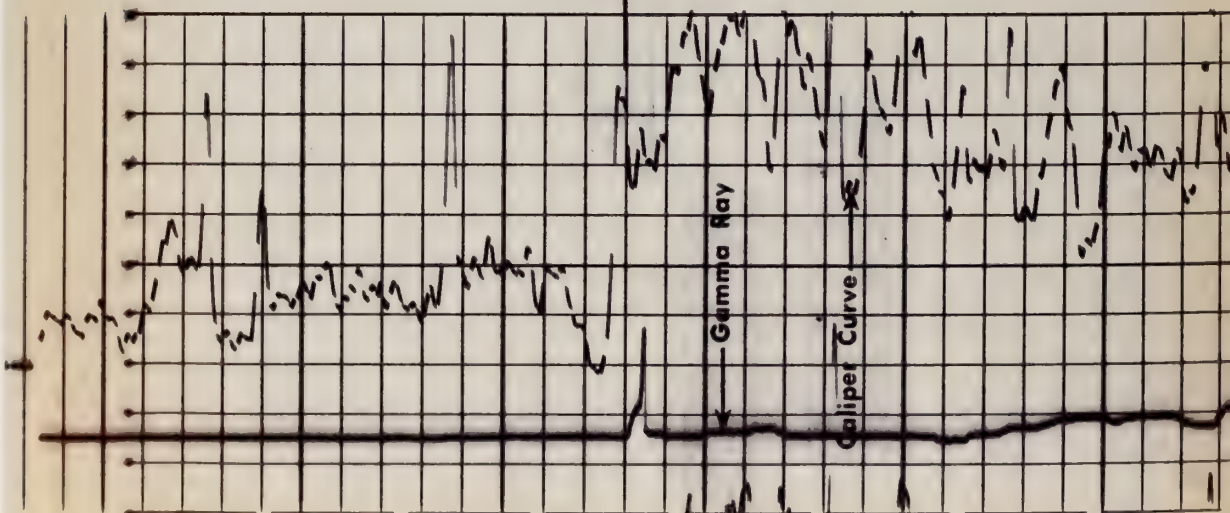


0100

0200

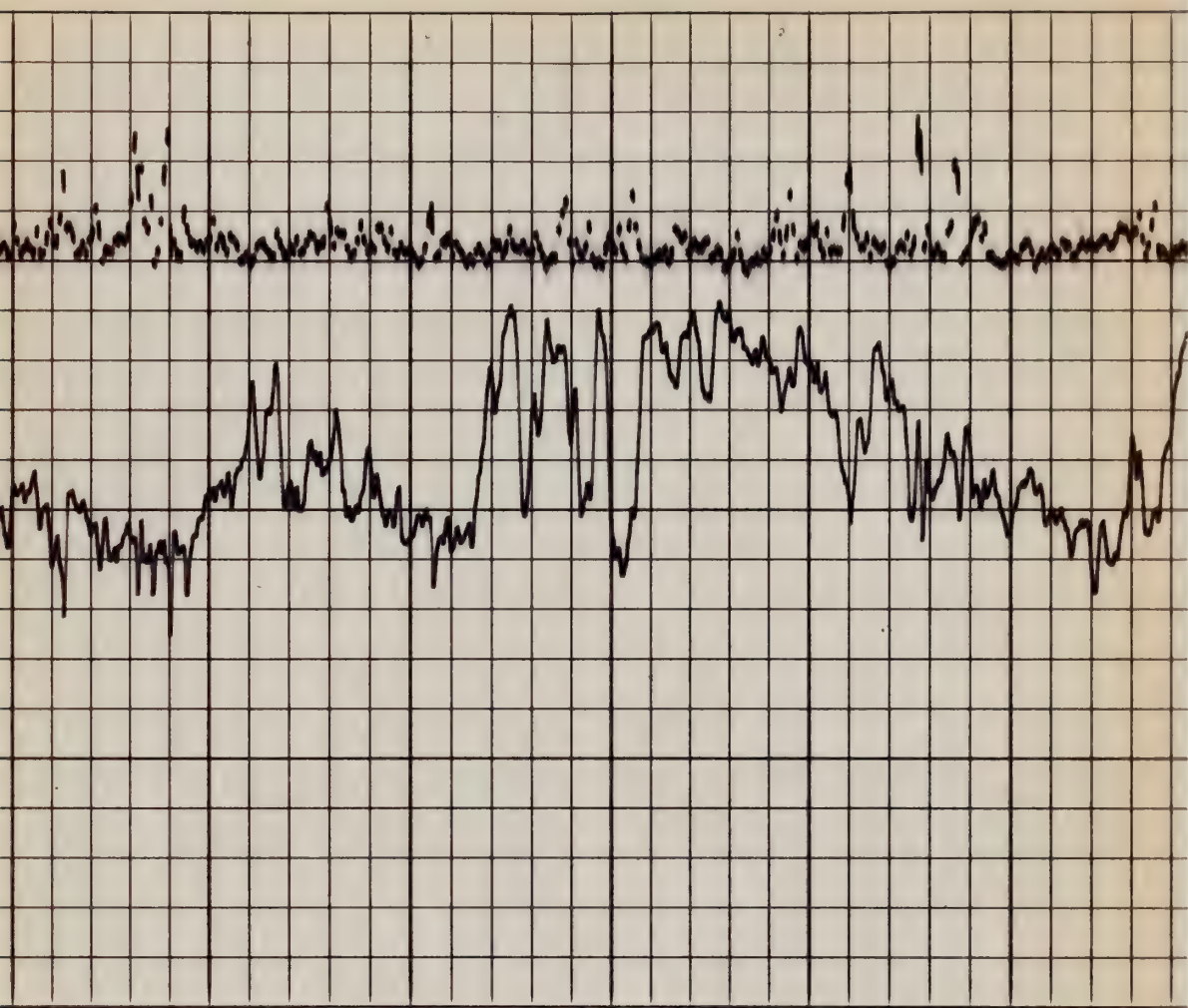
Casing

0300



Gamma Ray

Caliper Curve



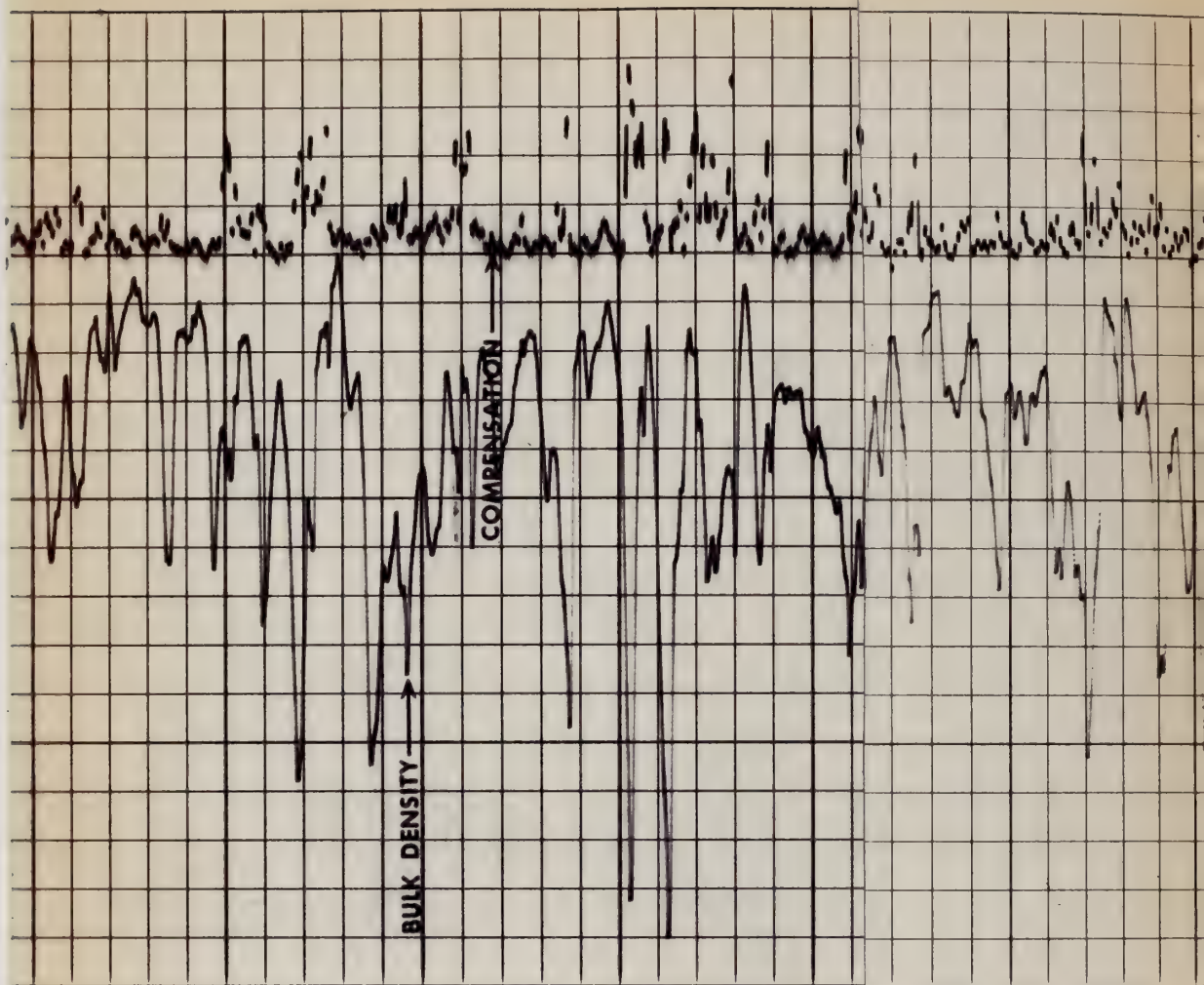
400

0500

0600

C



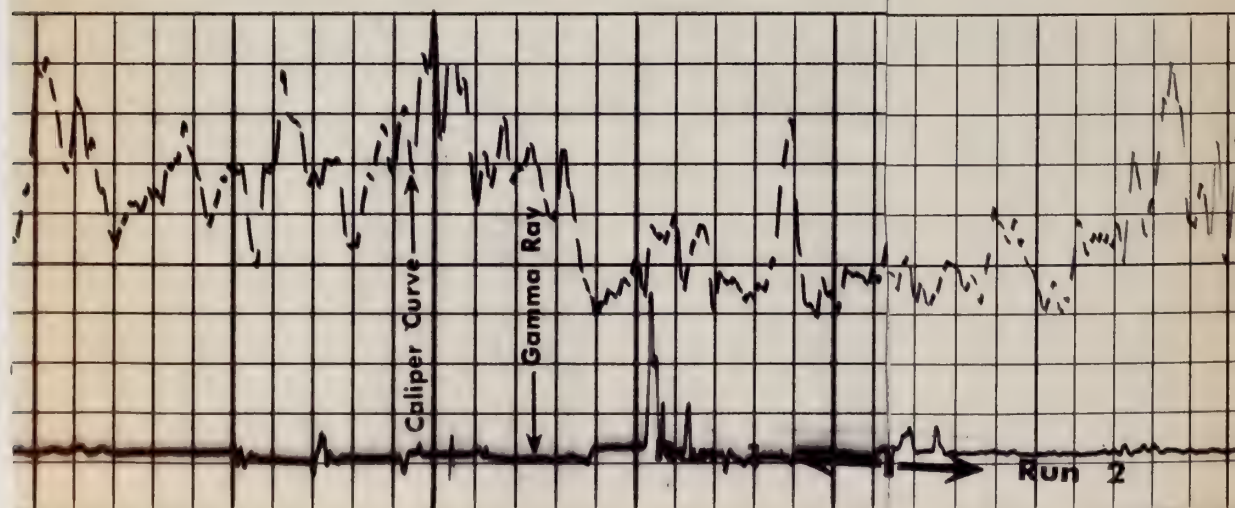


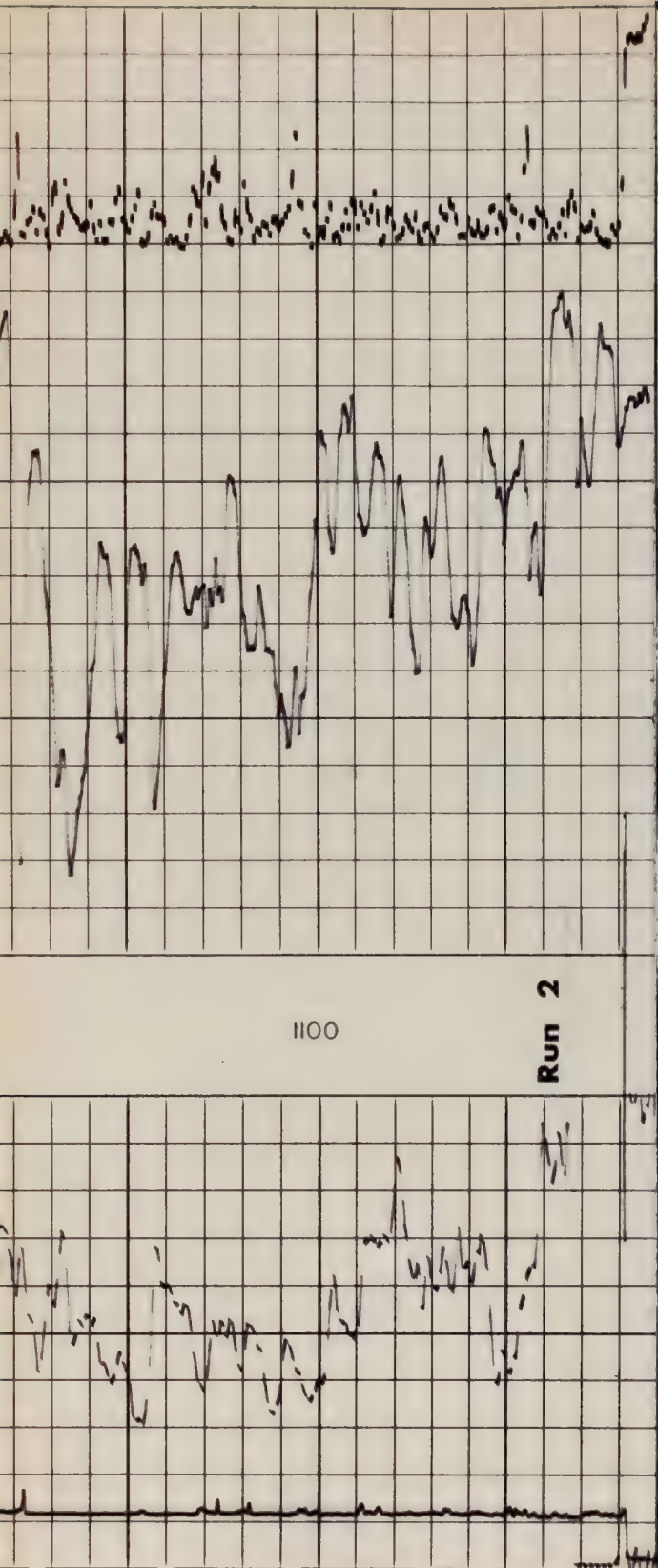
0700

0800

0900

1000





5" DETAIL LOG

CALIPER HOLE DIAM. IN INCHES	DEPTHS	CORRECTION GRAMS CC.
	5 15	
CALIBER DATA		DENSITY

GAMMA RAY

API UNITS

0 150

150 300

BULK DENSITY

GRAMS / CC.

1.7

2.2

2.7

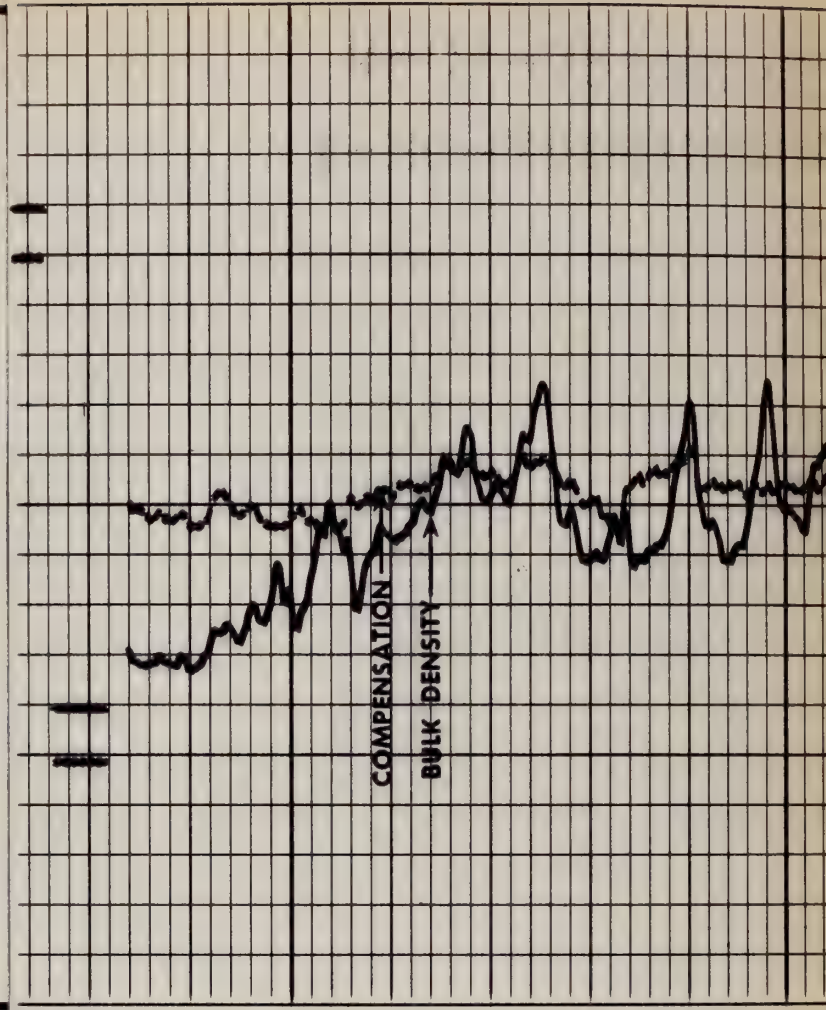
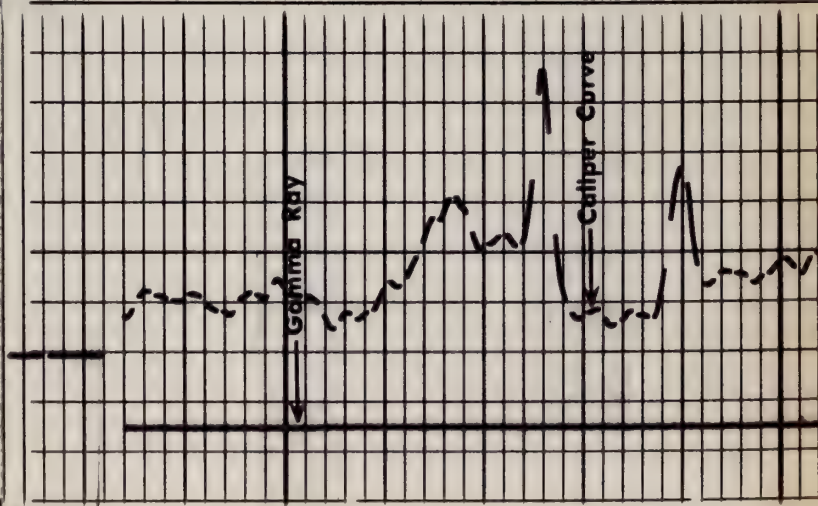
.7

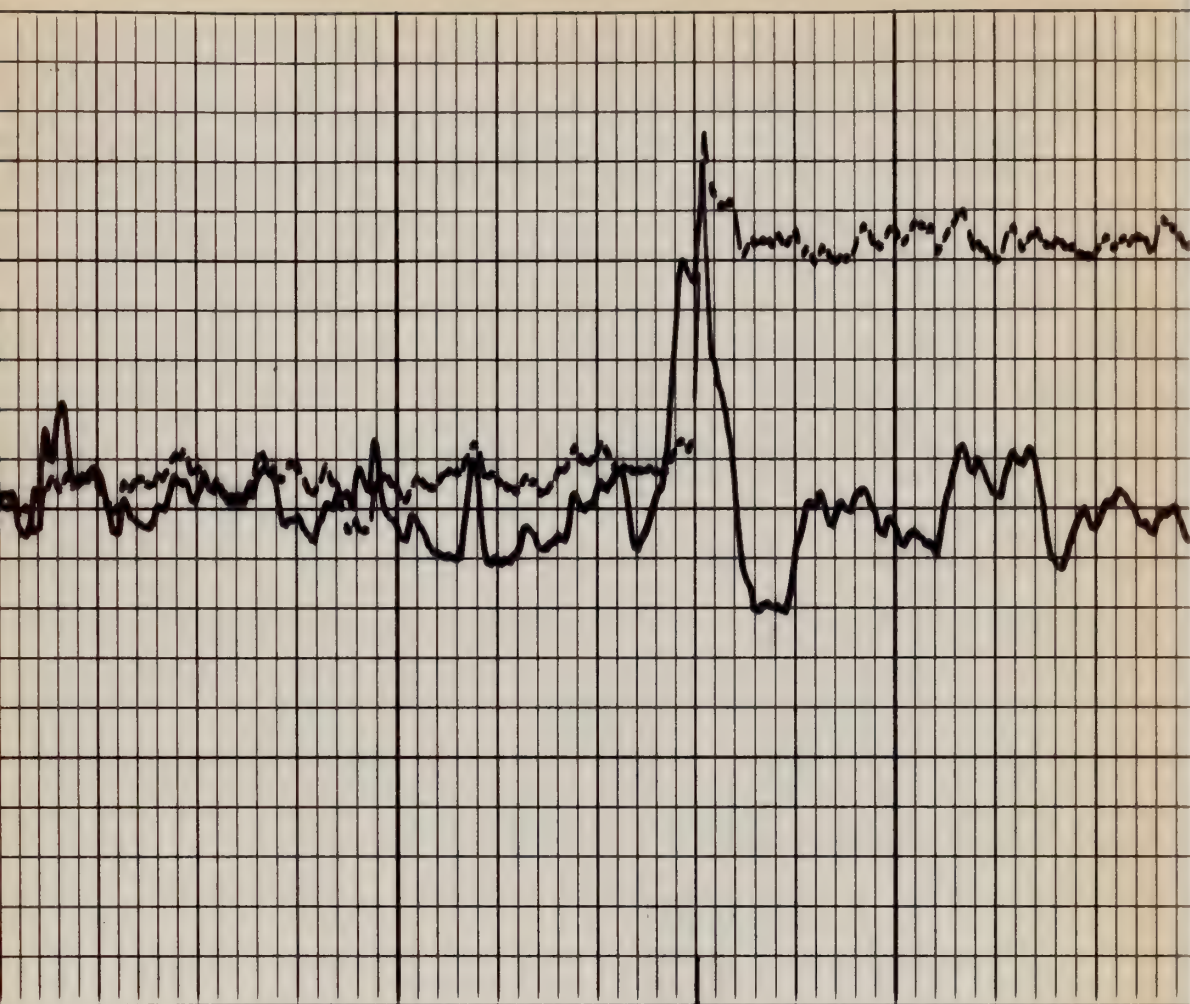
1.2

1.7

Run 1

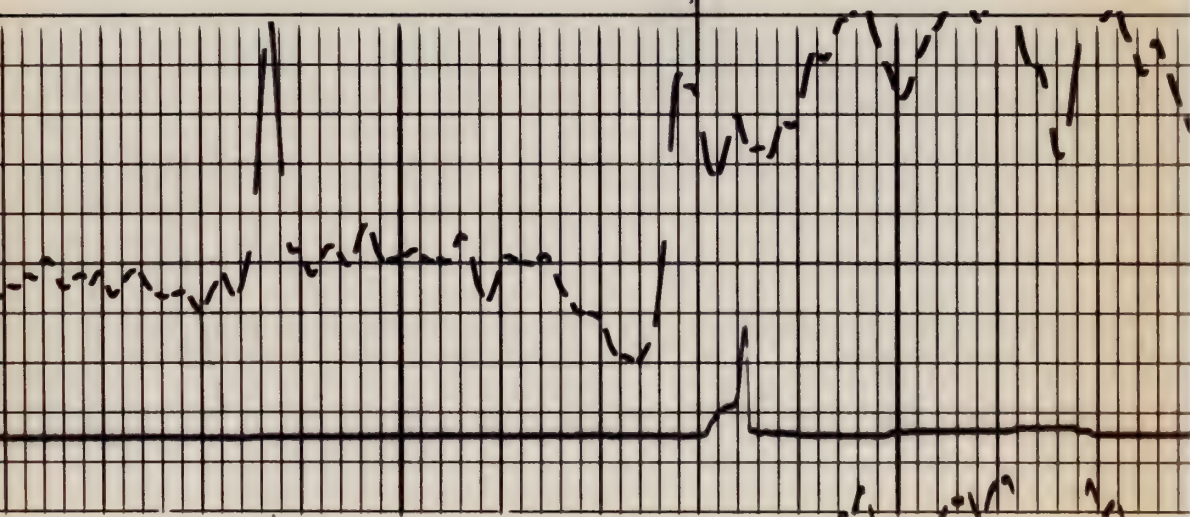
0100

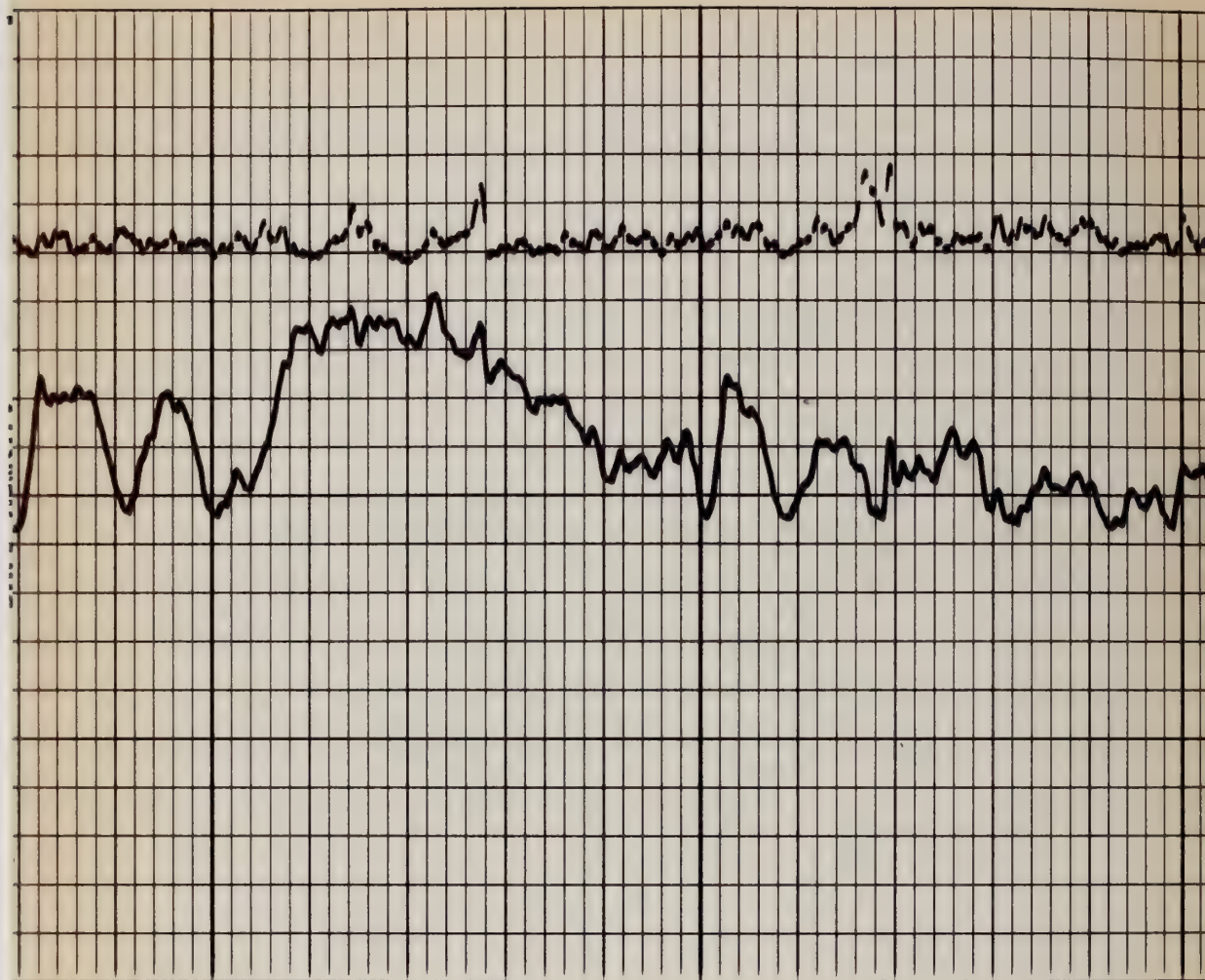




0200

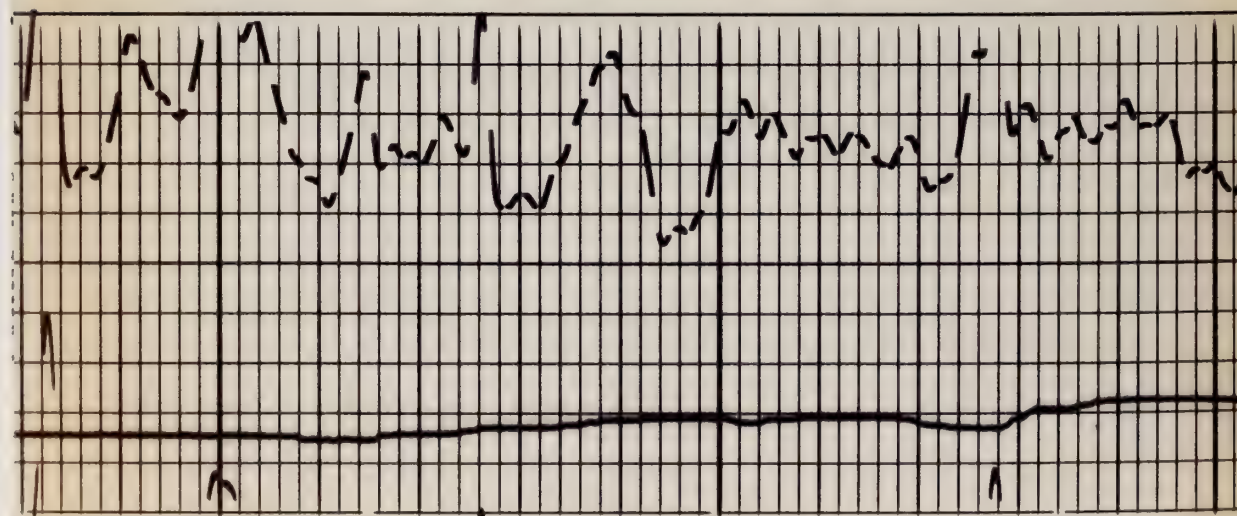
Casing

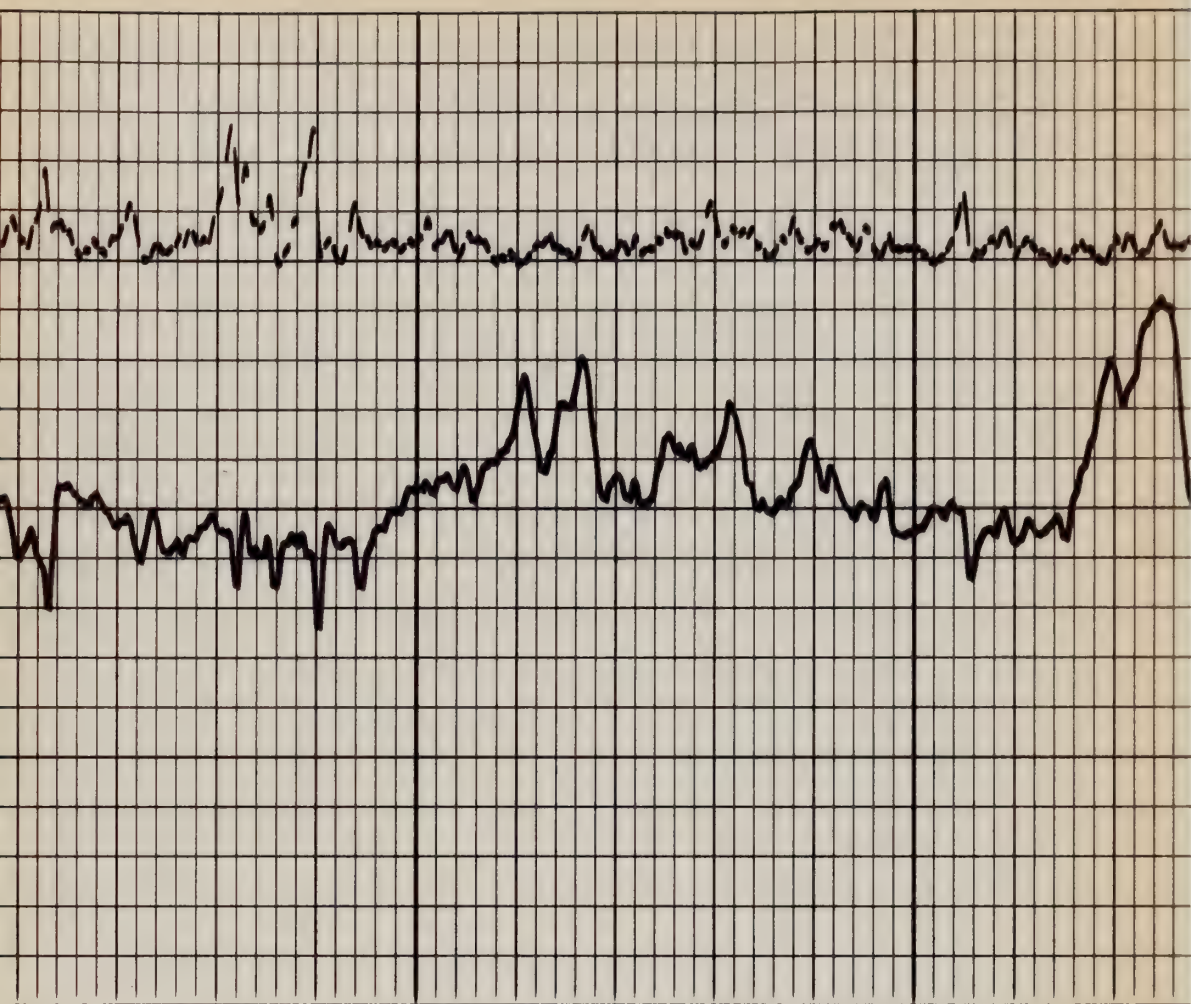




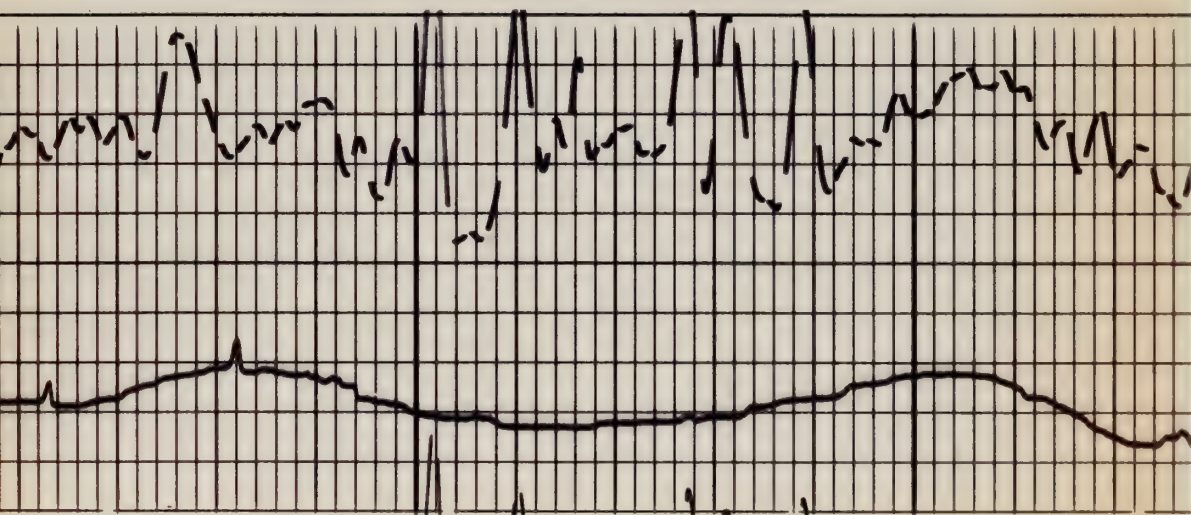
0300

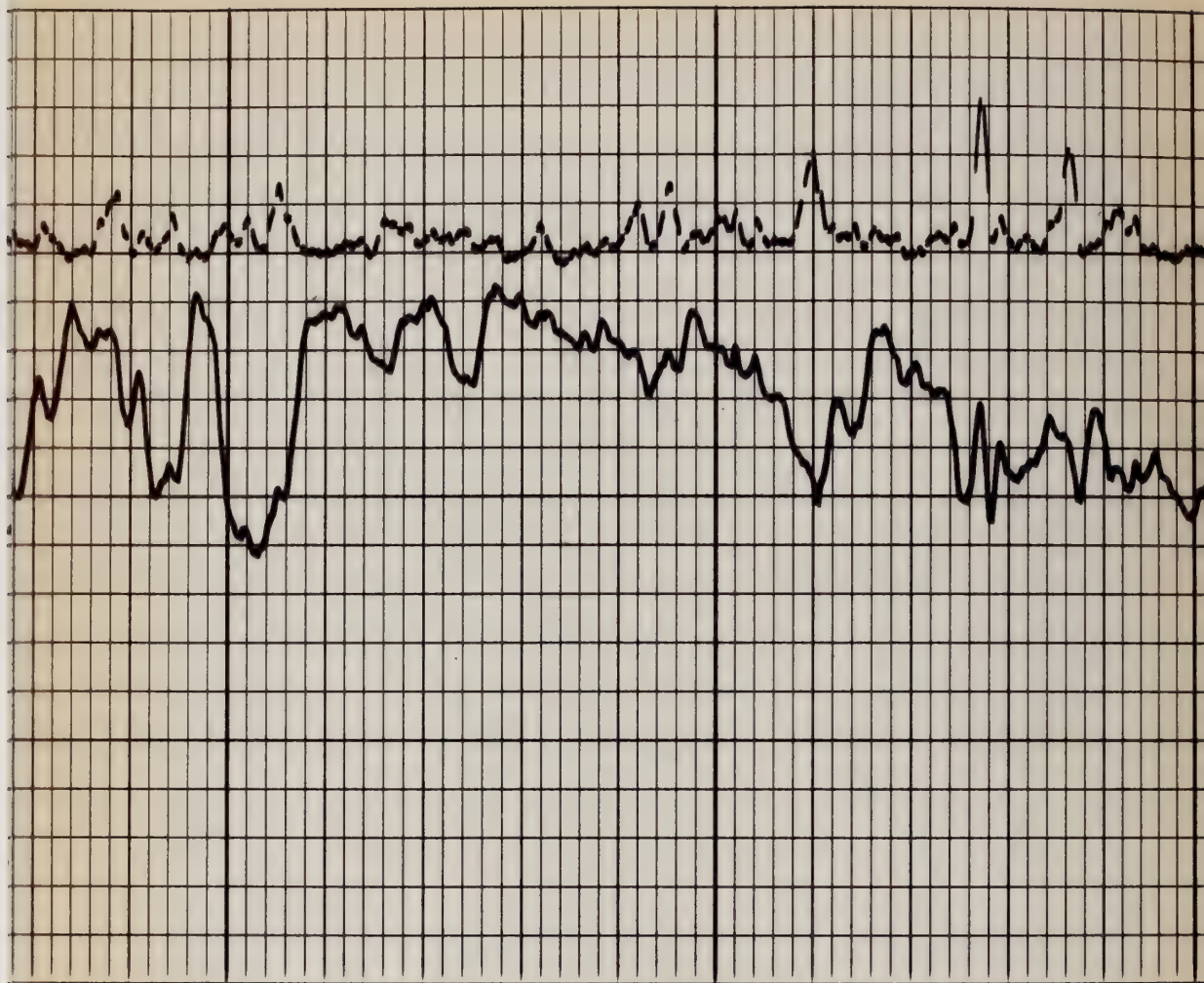
0400



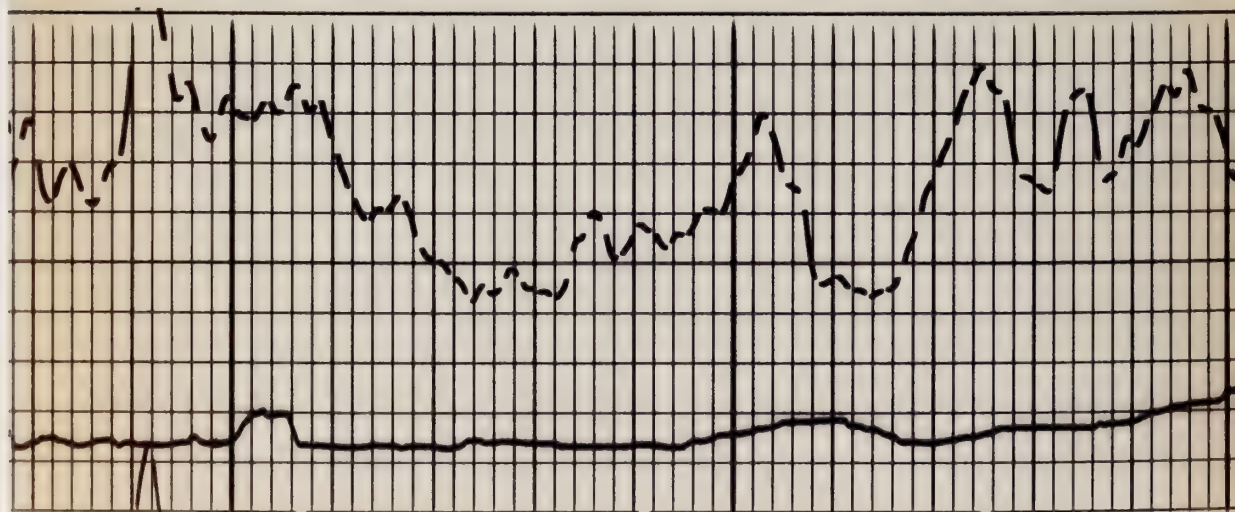


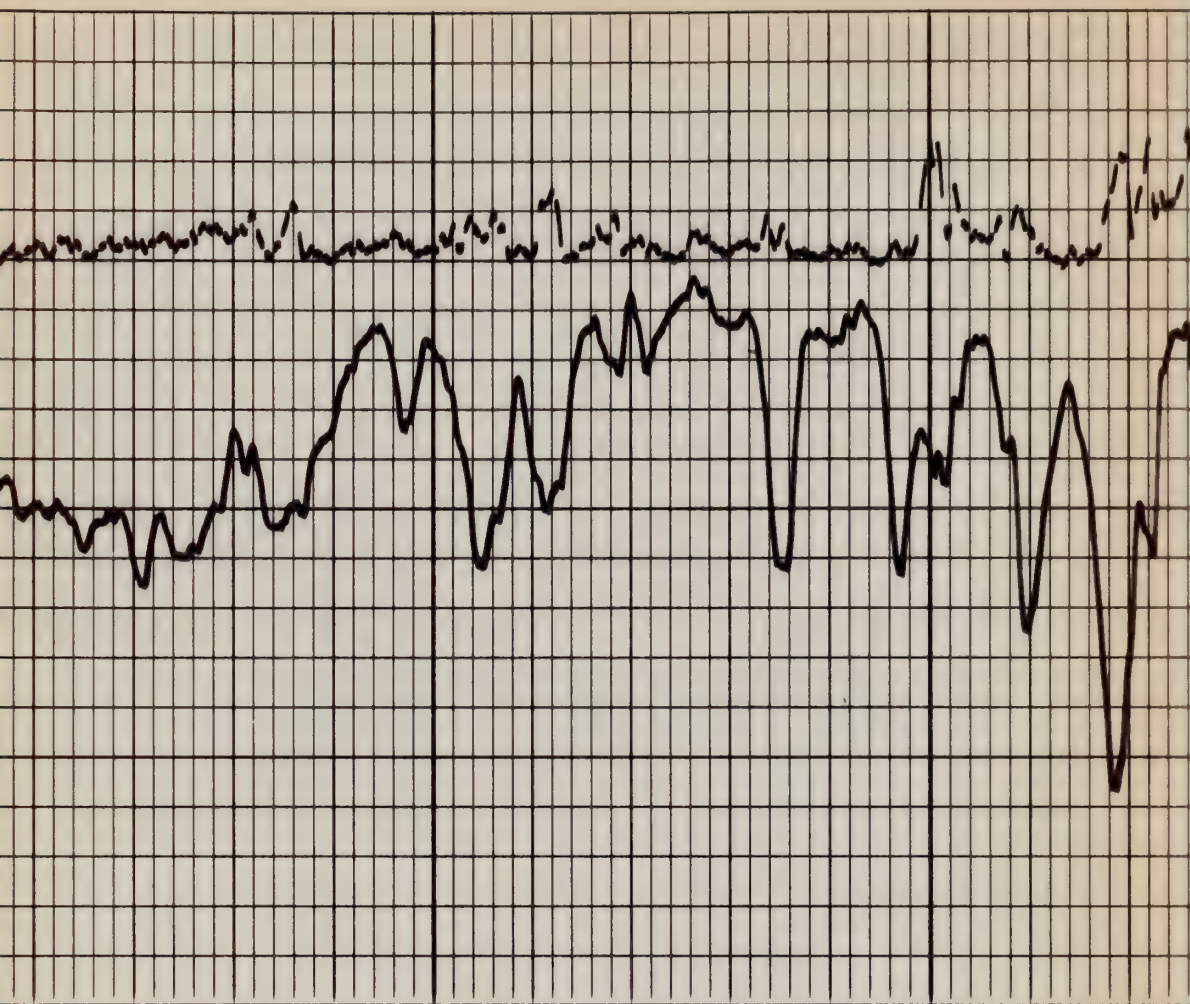
0500



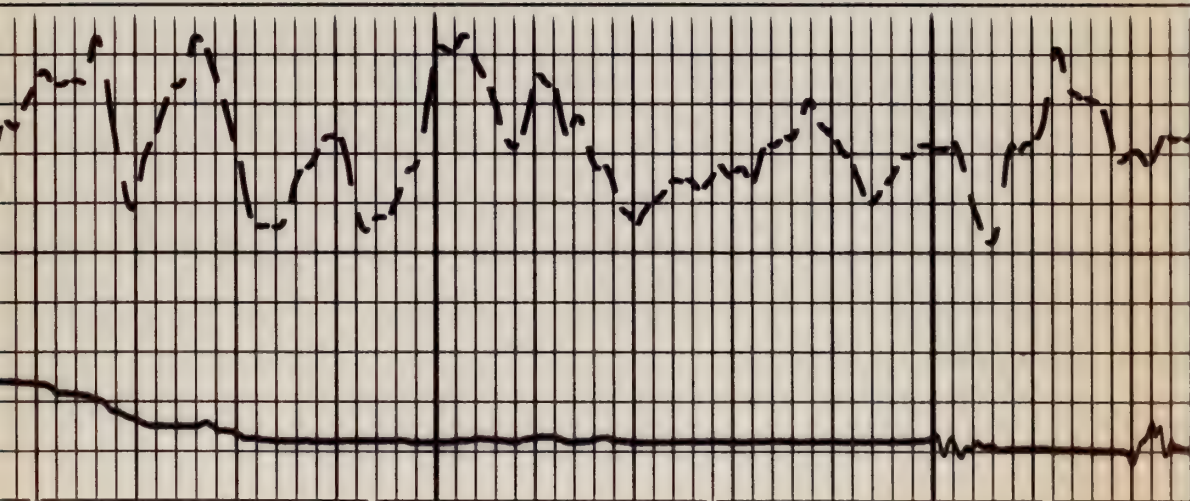


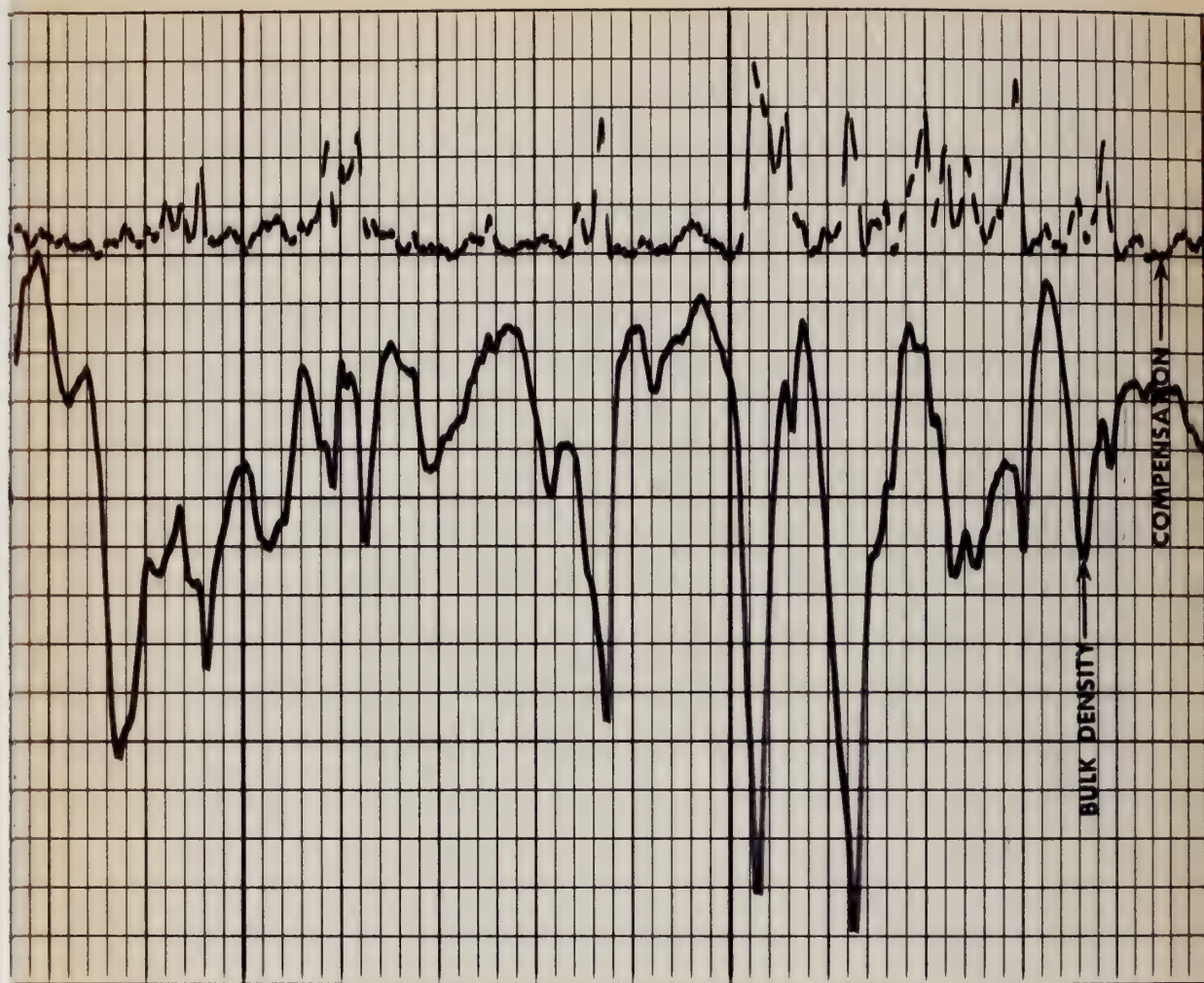
0600





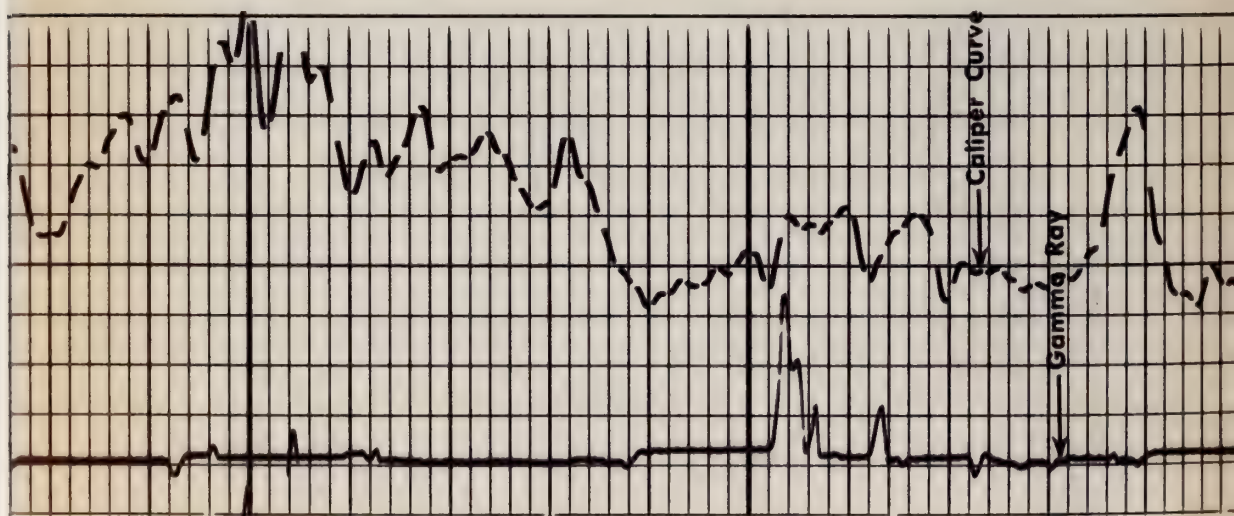
0700





0800

09



Run 1

Run 1

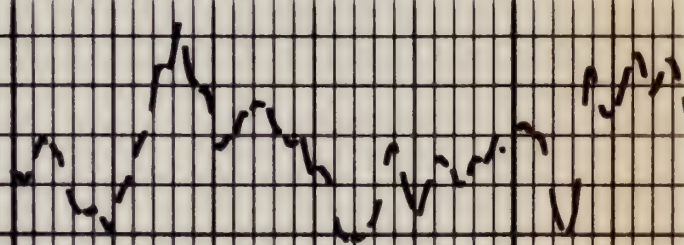
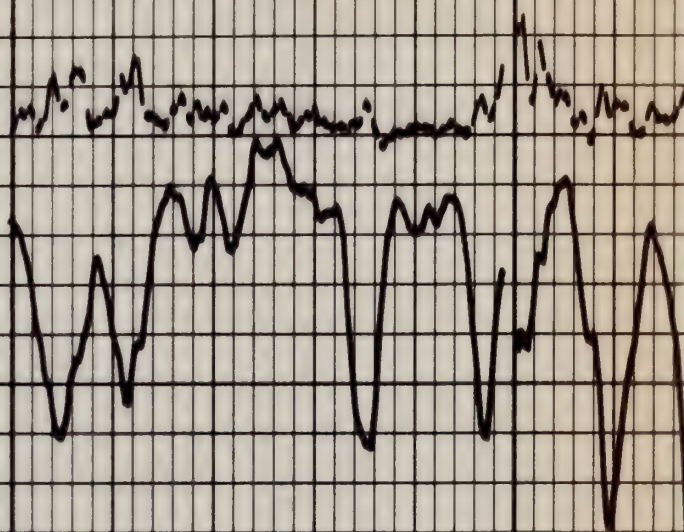
ALID

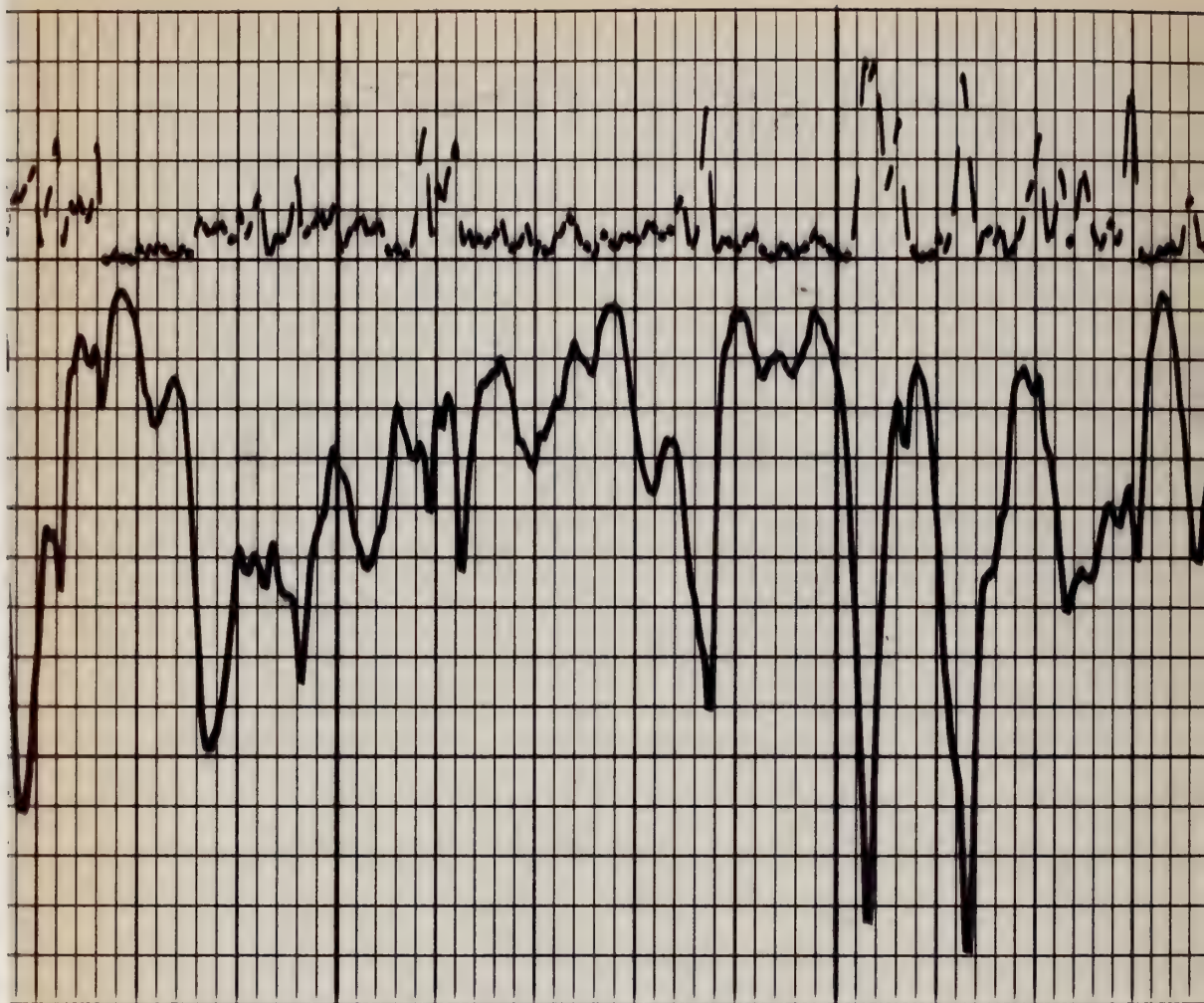
0700

MEMORIZER O

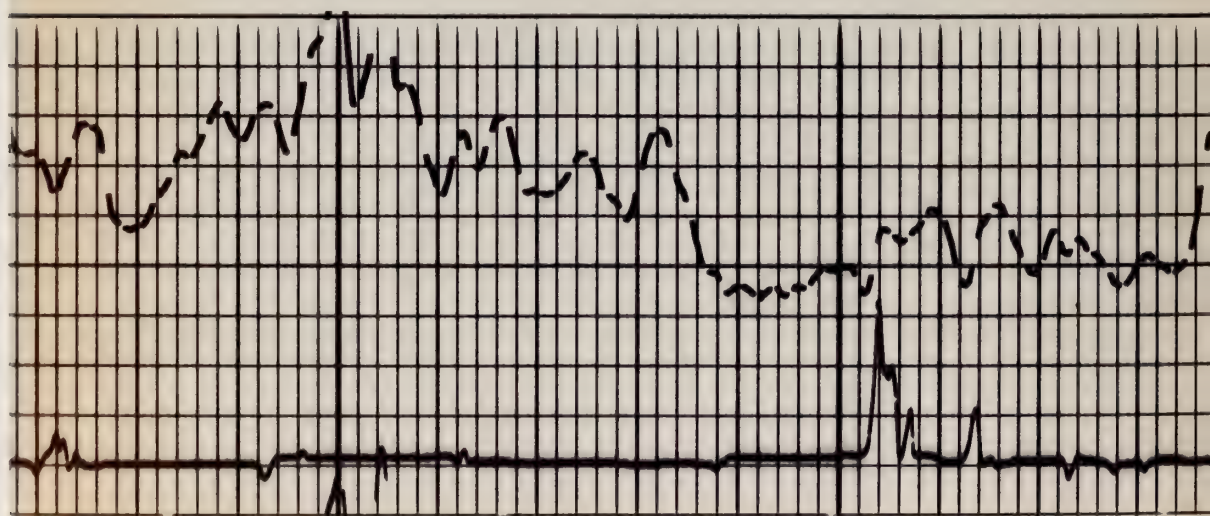
REPEAT SECTION

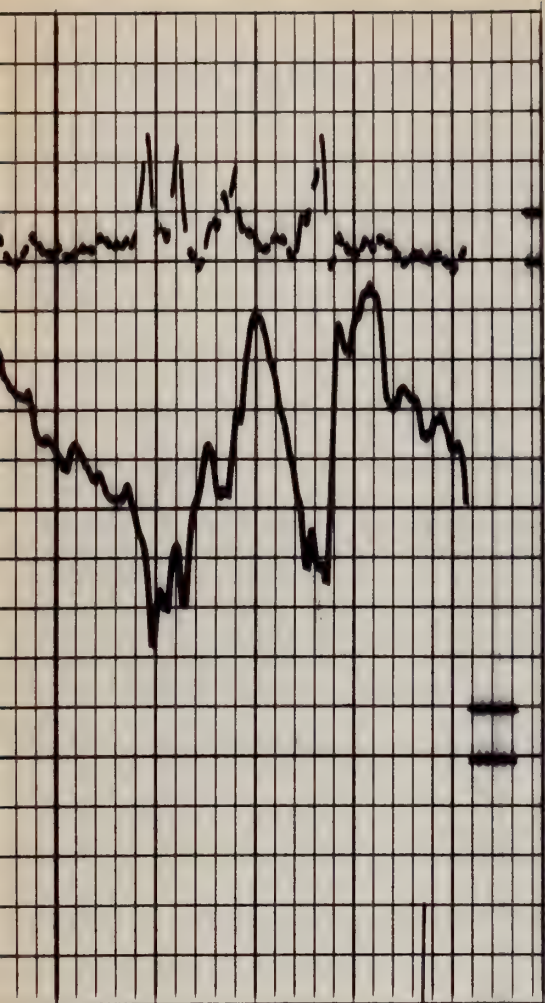
II





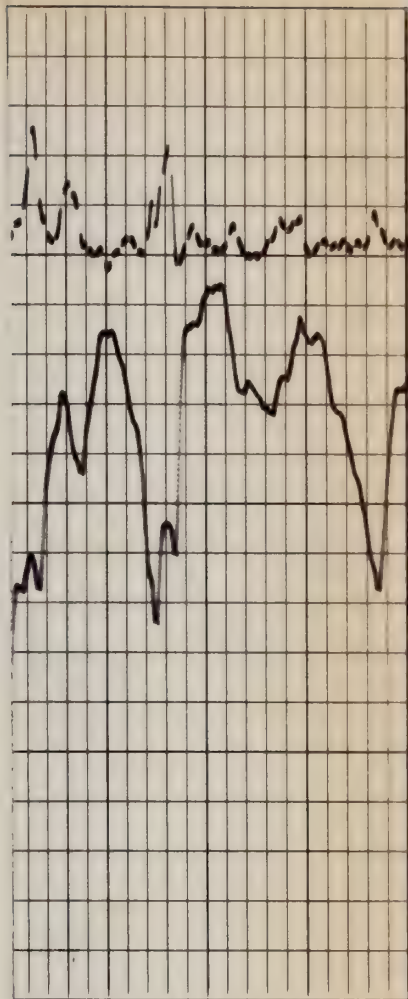
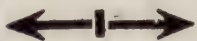
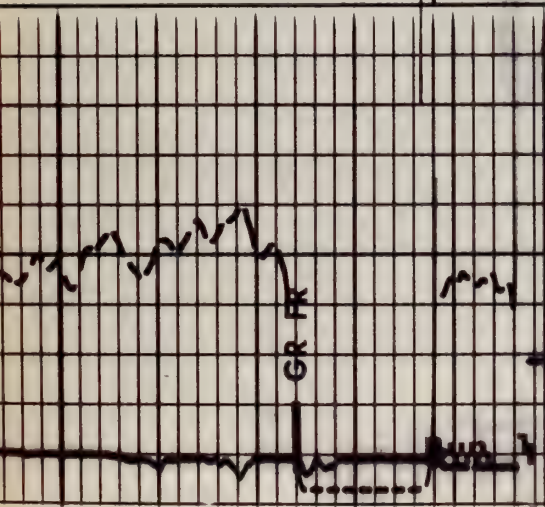
0800



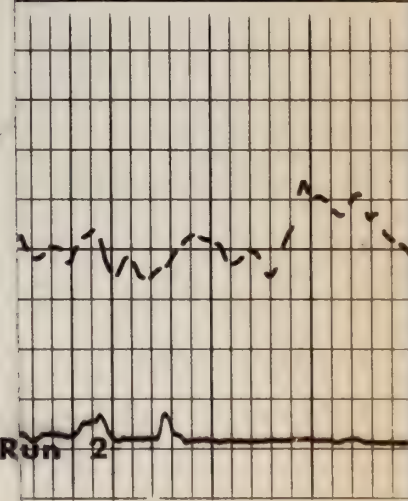


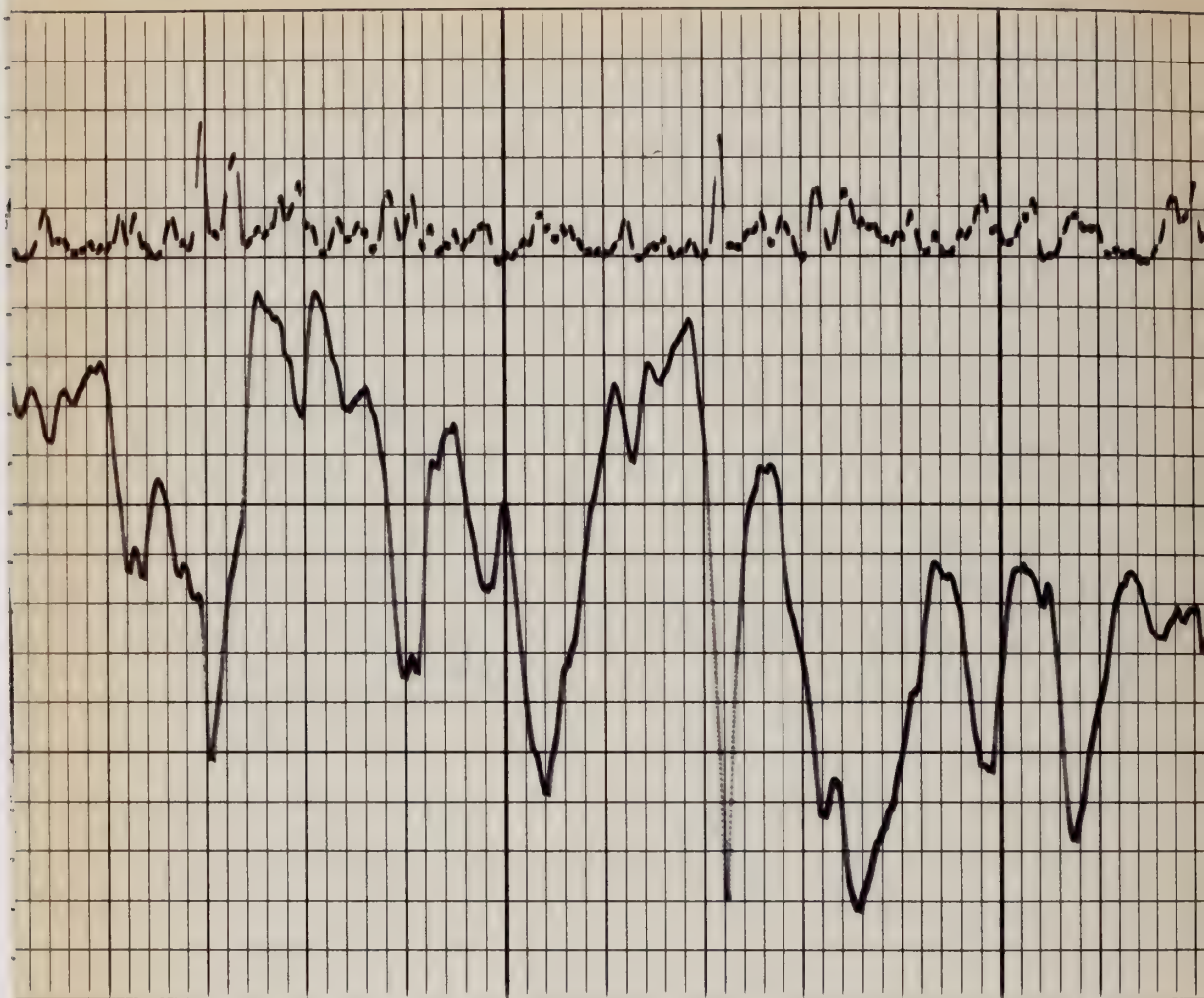
0900

RUN 1

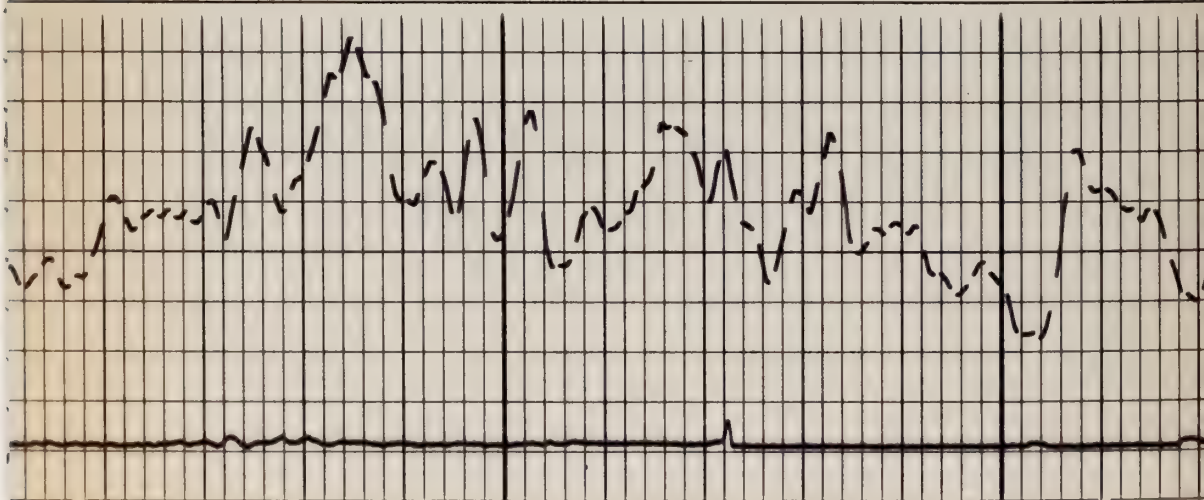


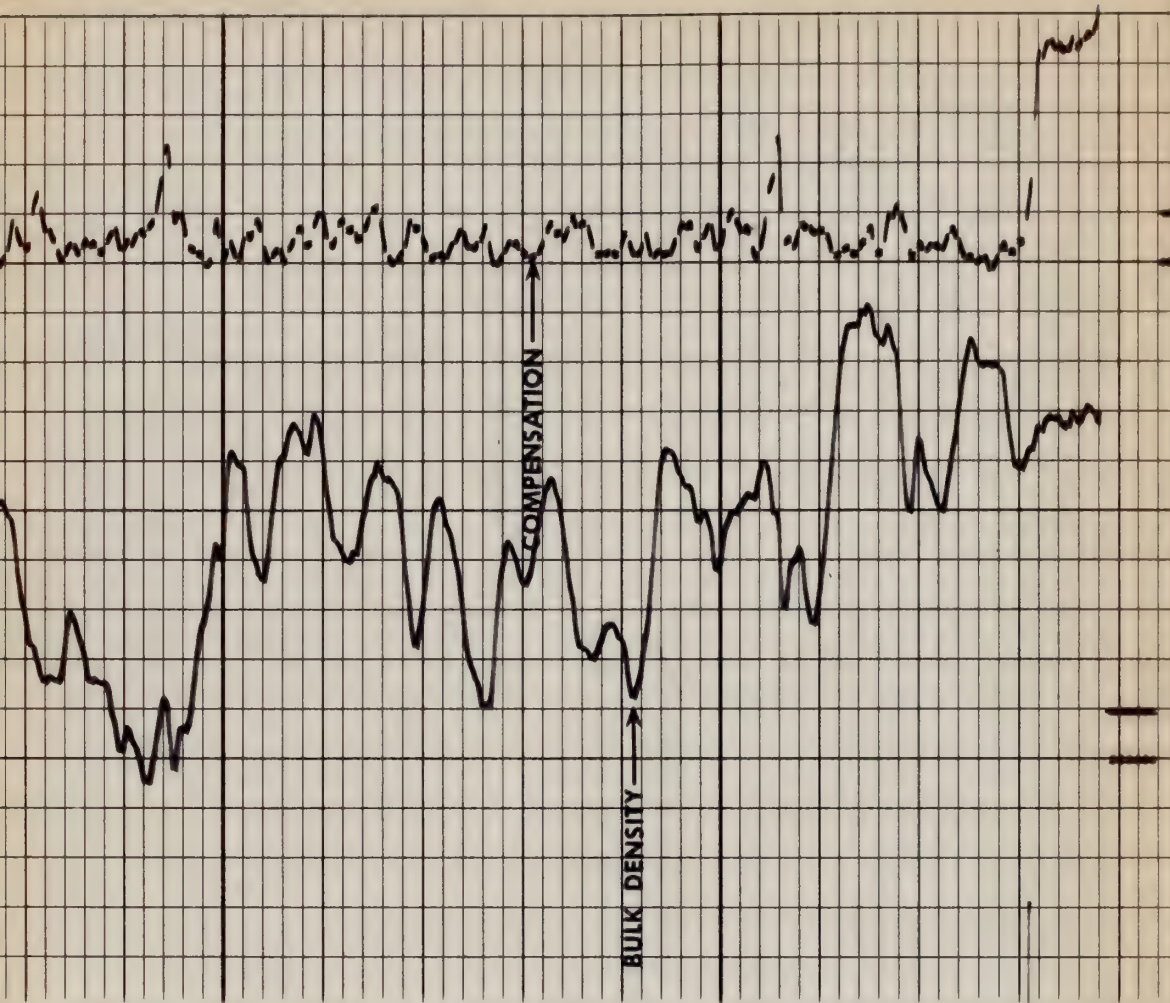
Run 2





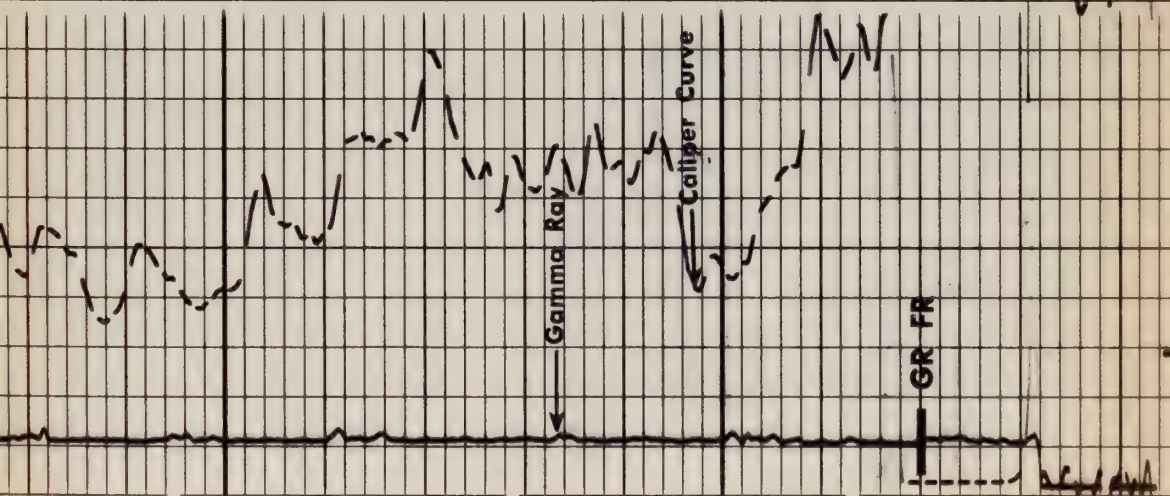
1000





1100

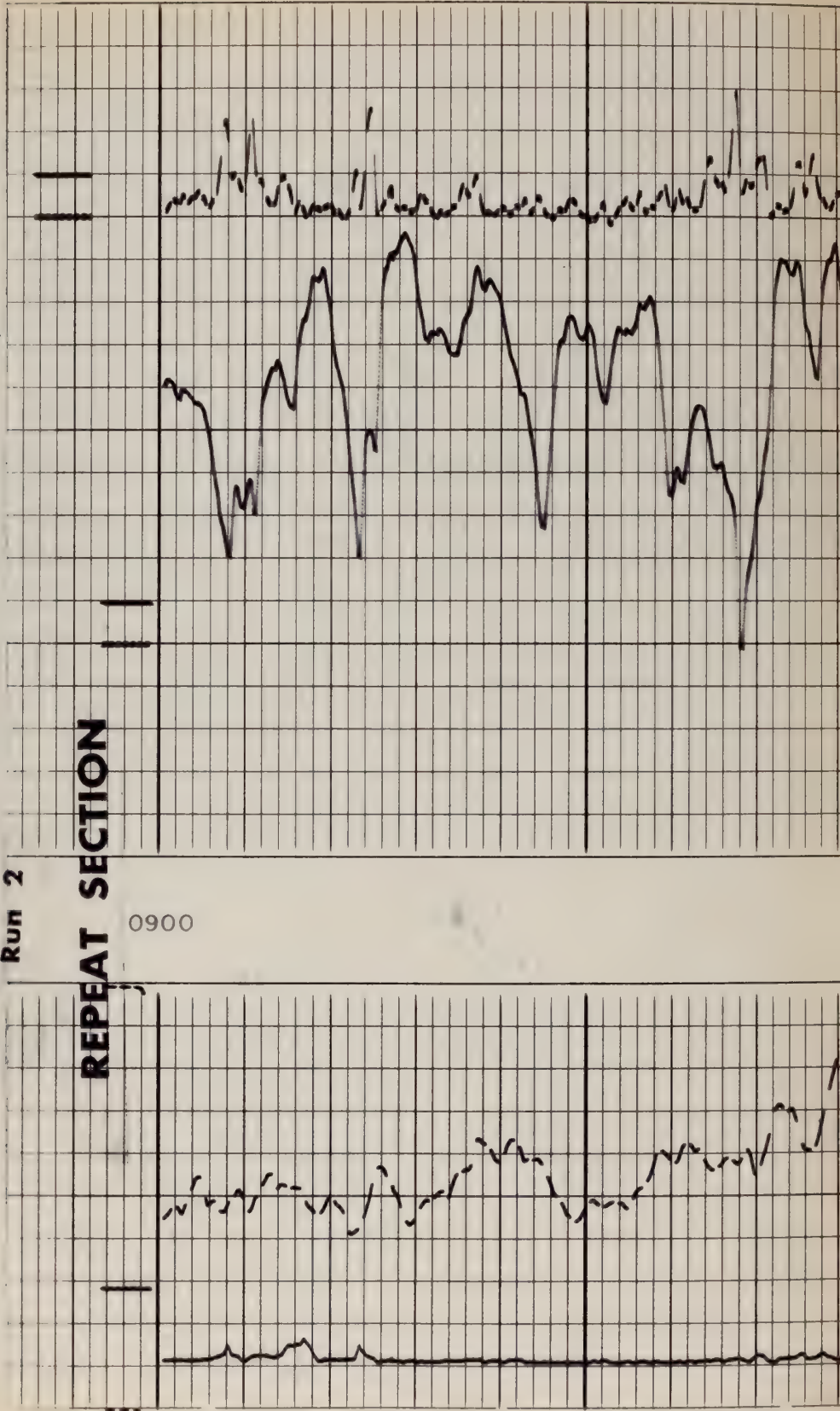
Run 2

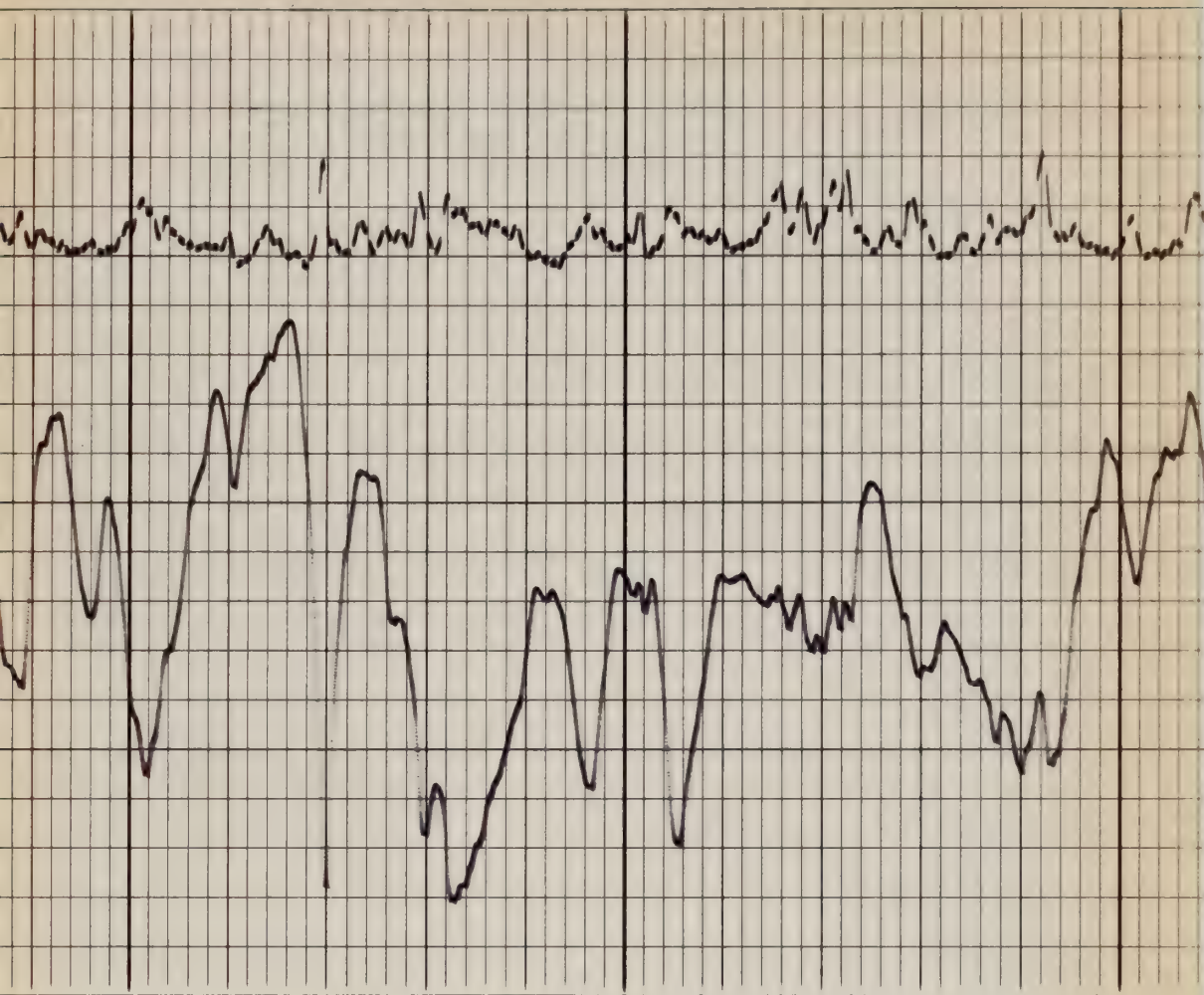


Run 2

REPEAT SECTION

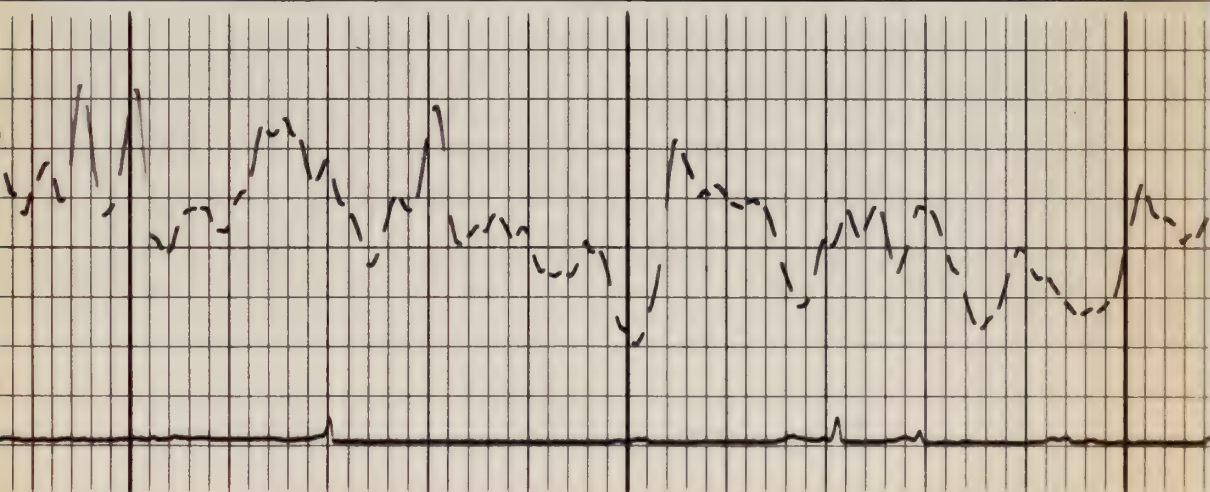
0900

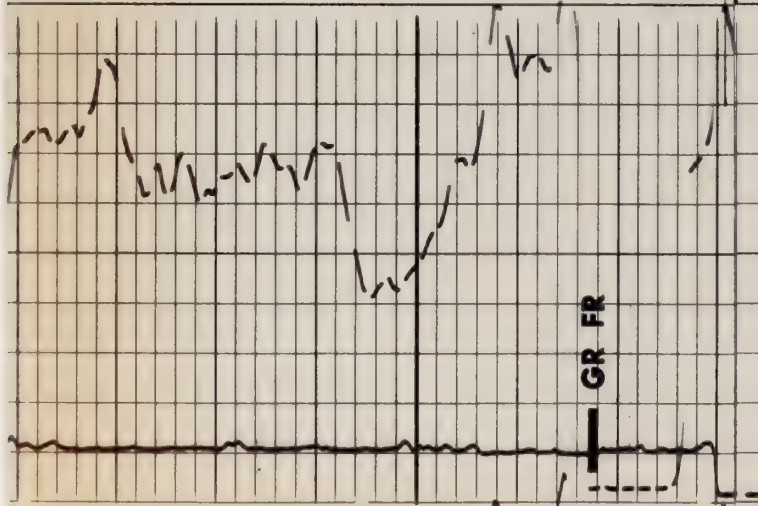




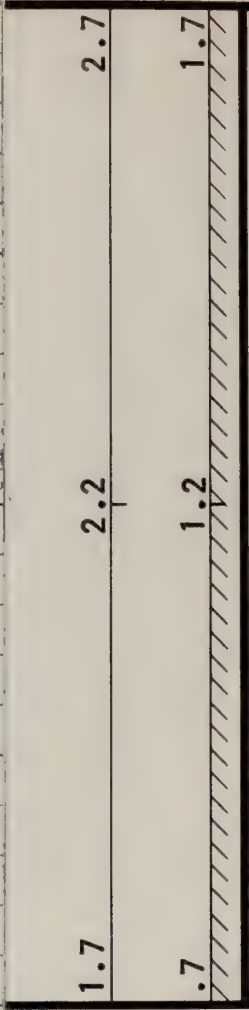
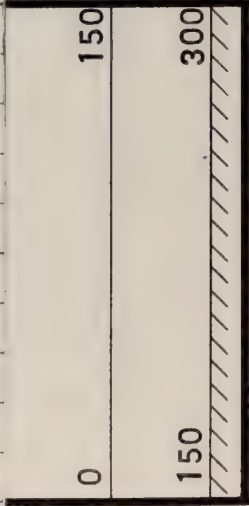
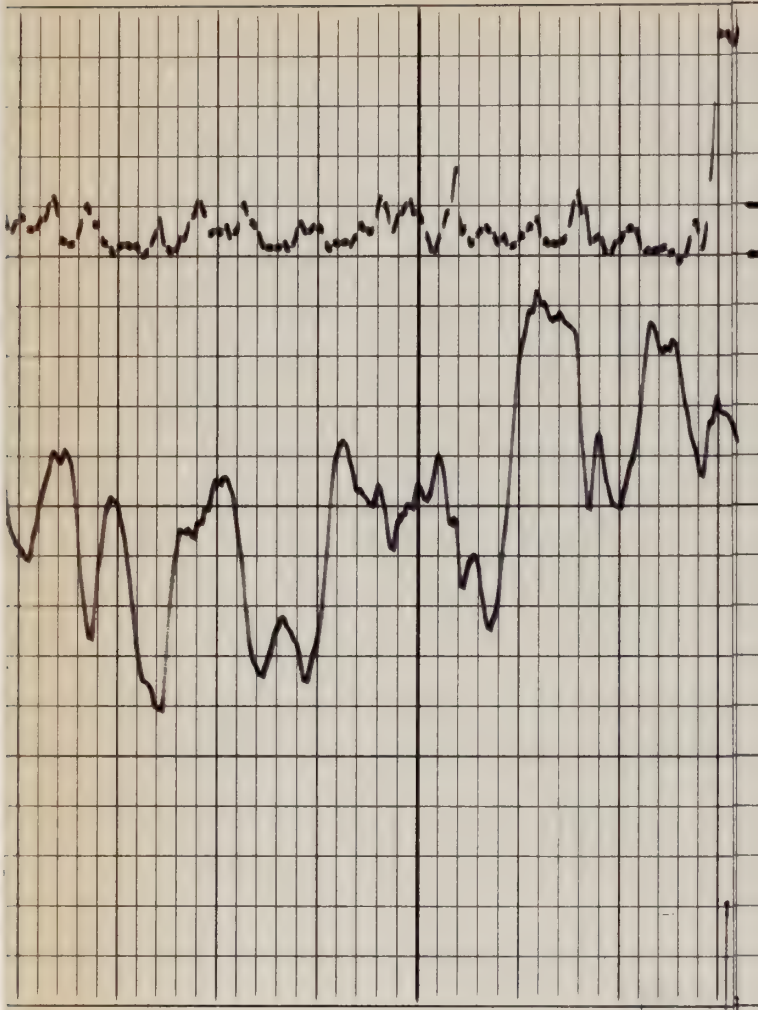
1000

1100





Run 2



GAMMA RAY
API UNITS

BULK DENSITY
GRAMS/CC.

15

15

 $+.25$

0

0

CORRECTION

GRAMS / CC.

CALIPER

HOLE DIAM. IN INCHES

DEPTHS

COMPANY ATLANTIC RICHFIELD CO.

WELL _____ SORGHUM GULCH 1-A

FIELD _____ SORGHUM GULCH _____

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 937

SCHL. TD 938

DRLR TD 938

Elev:

KB

DF -----

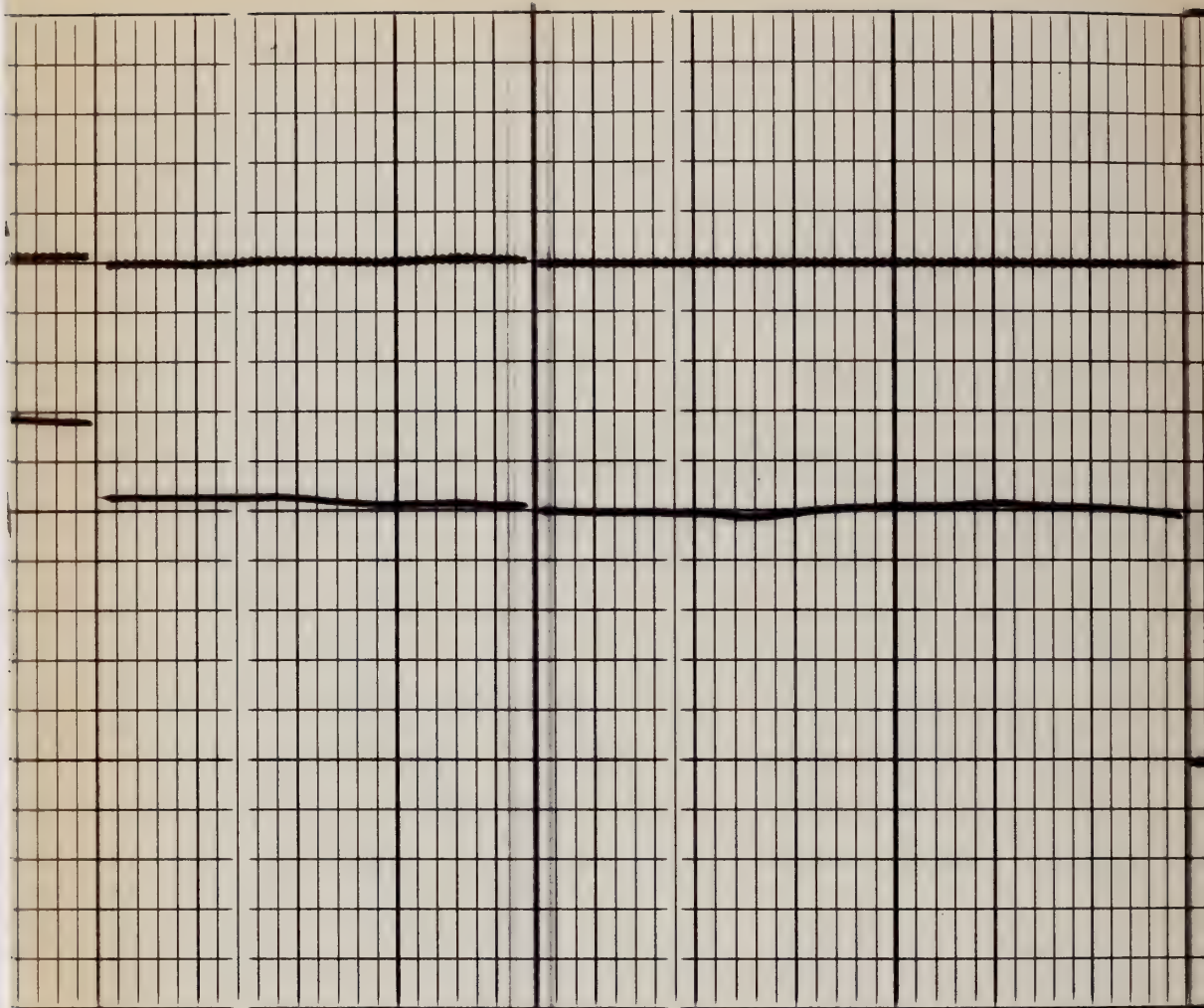
GL ---

CALIBRATION RECORD

Run 1

CALIBRATION AFTER SURVEY

13



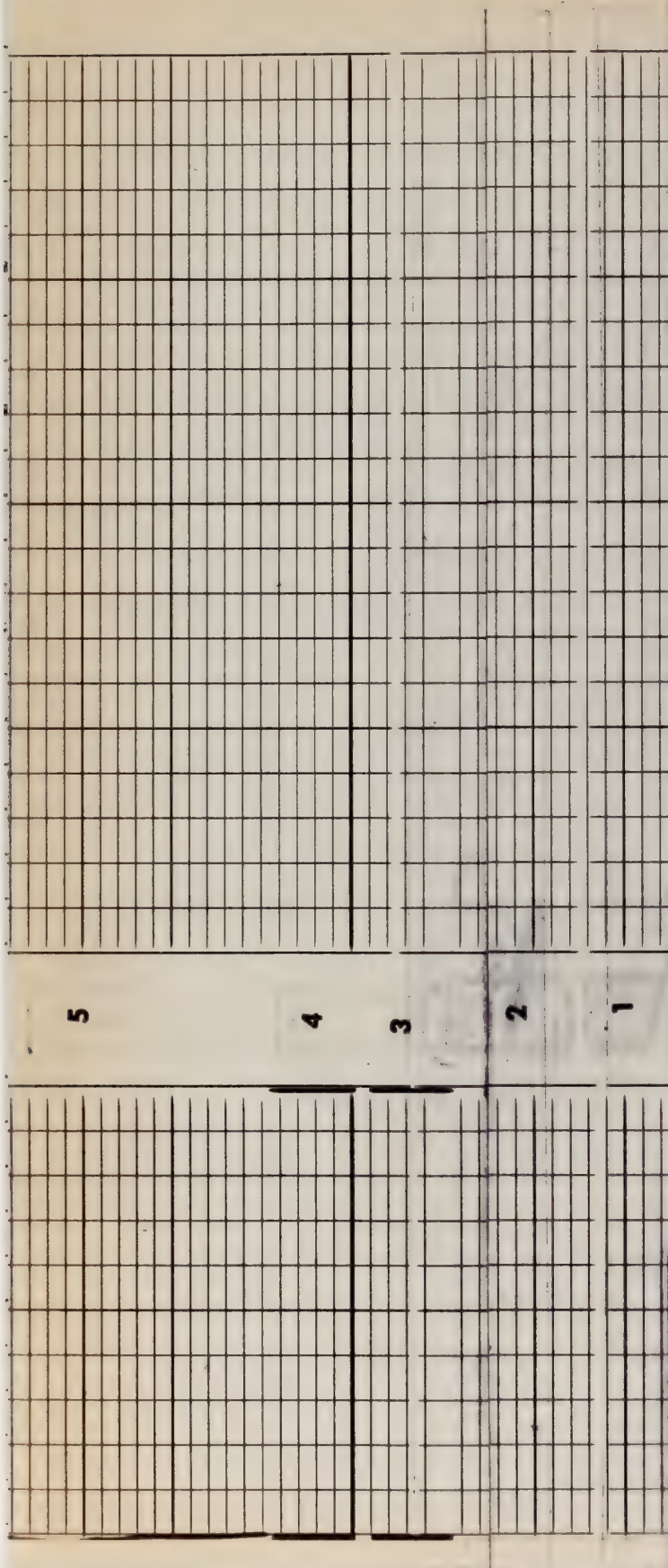
12

11

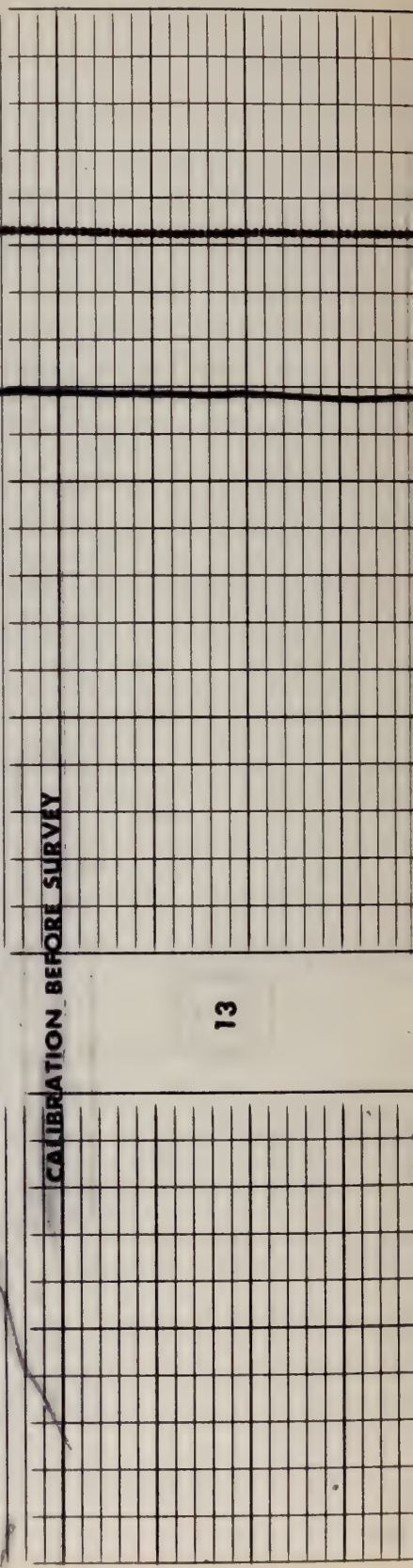
G. R. SURFACE CALIBRATION

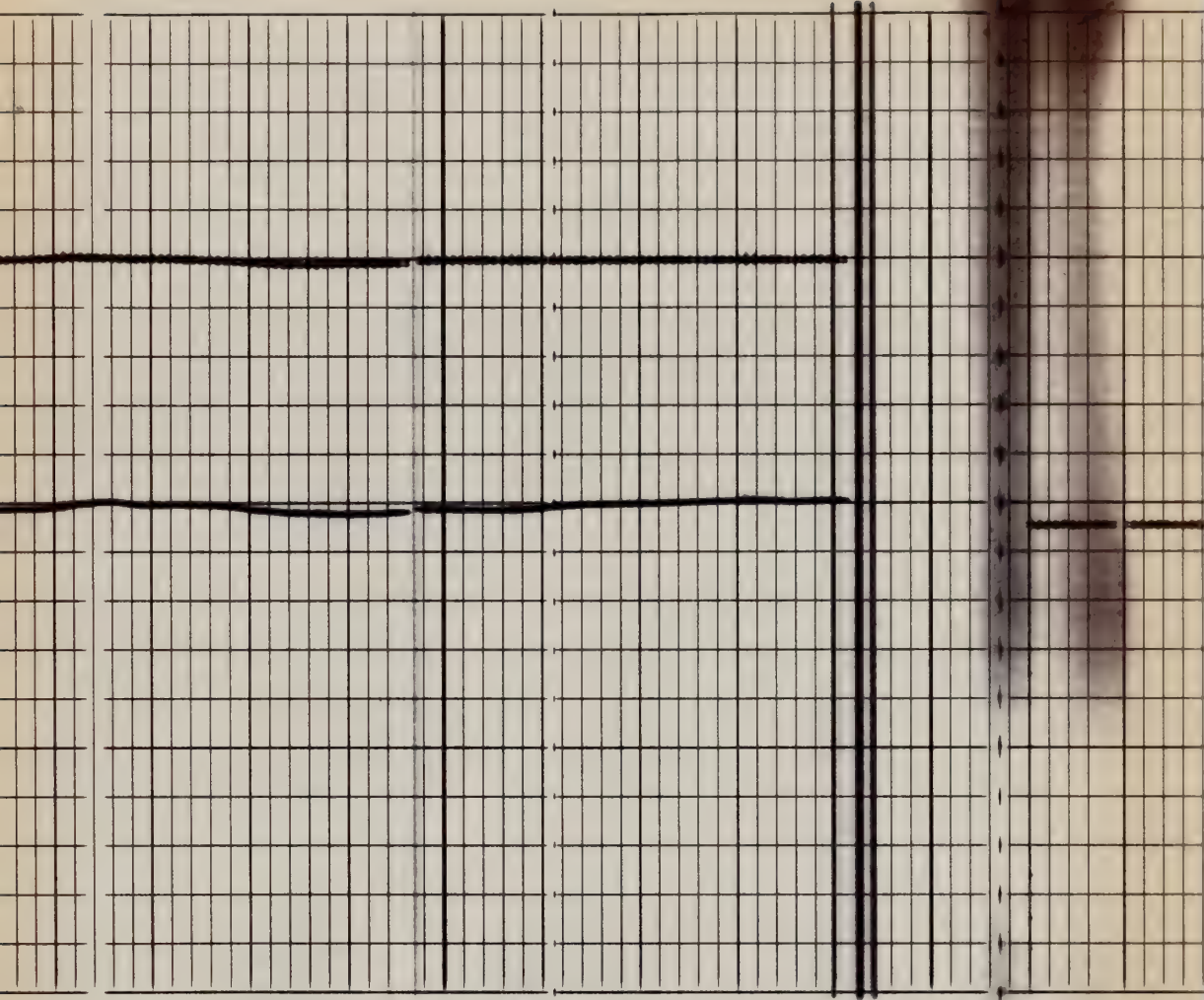
6

7/20/71



CALIBRATION BEFORE SURVEY





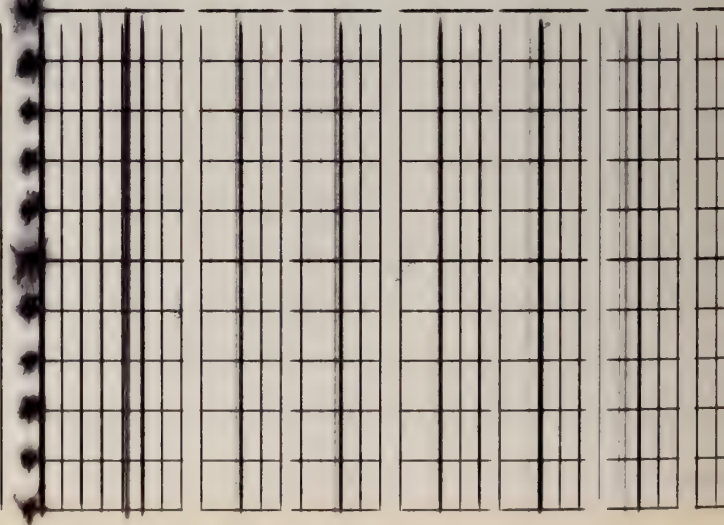
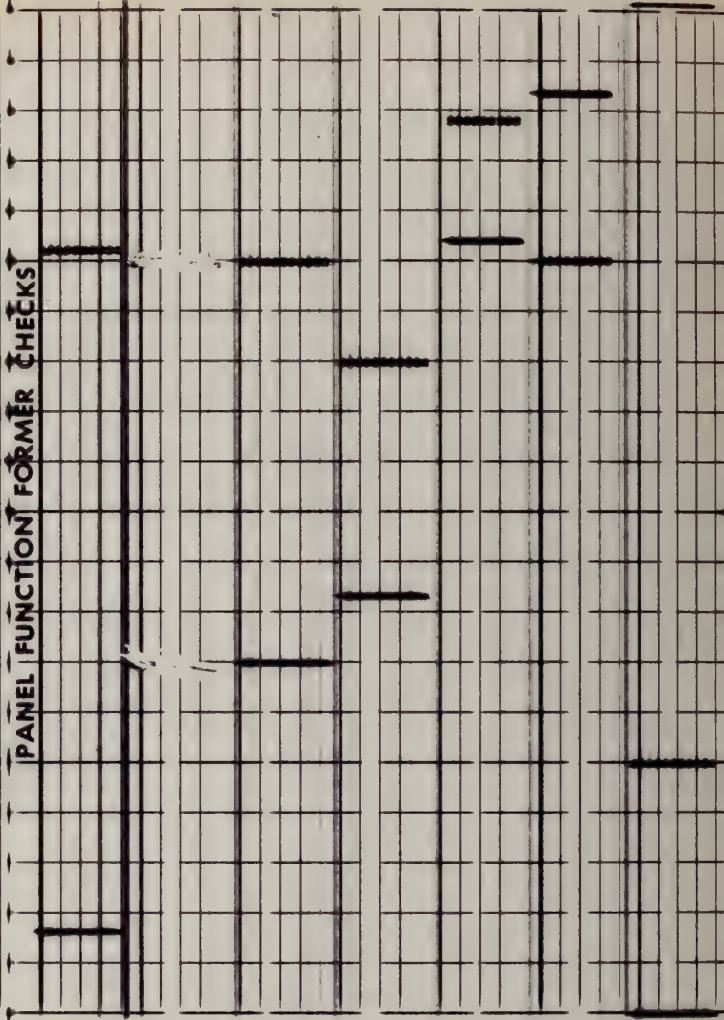
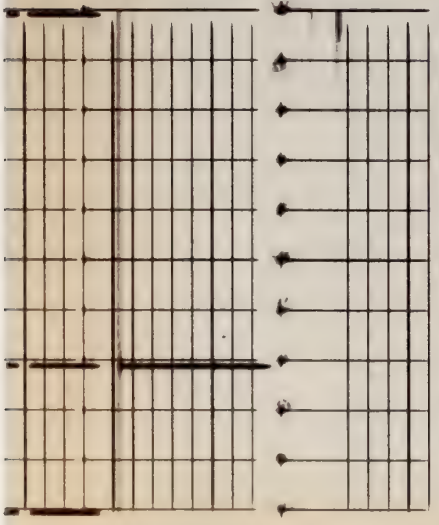
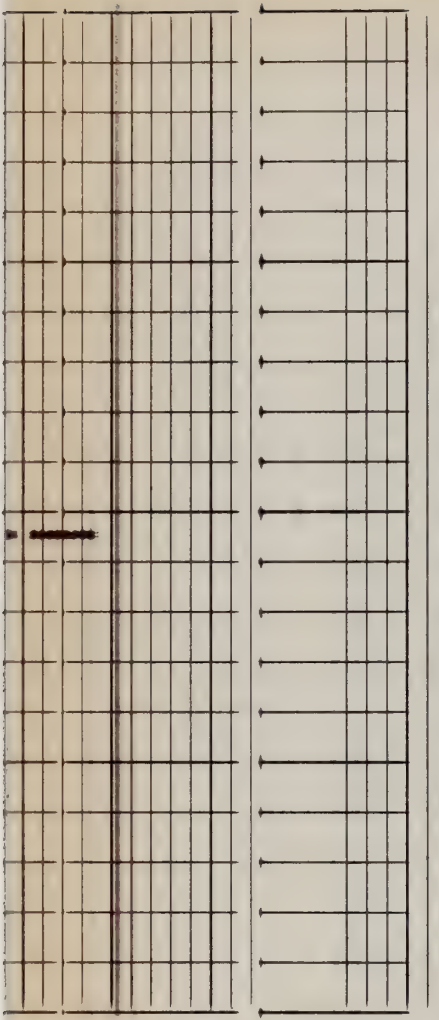
12

11

Caliper CALIBRATION

3

2



PANEL FUNCTION FORMER CHECKS

SHOP CAL

13

PDHED 618
SFT 106 210
CS 13090

PAP-CH 161

P-13124P-1054
5 JAN 1975



← ALIBRATION AFTER SURVEY

Run 2

Run 2

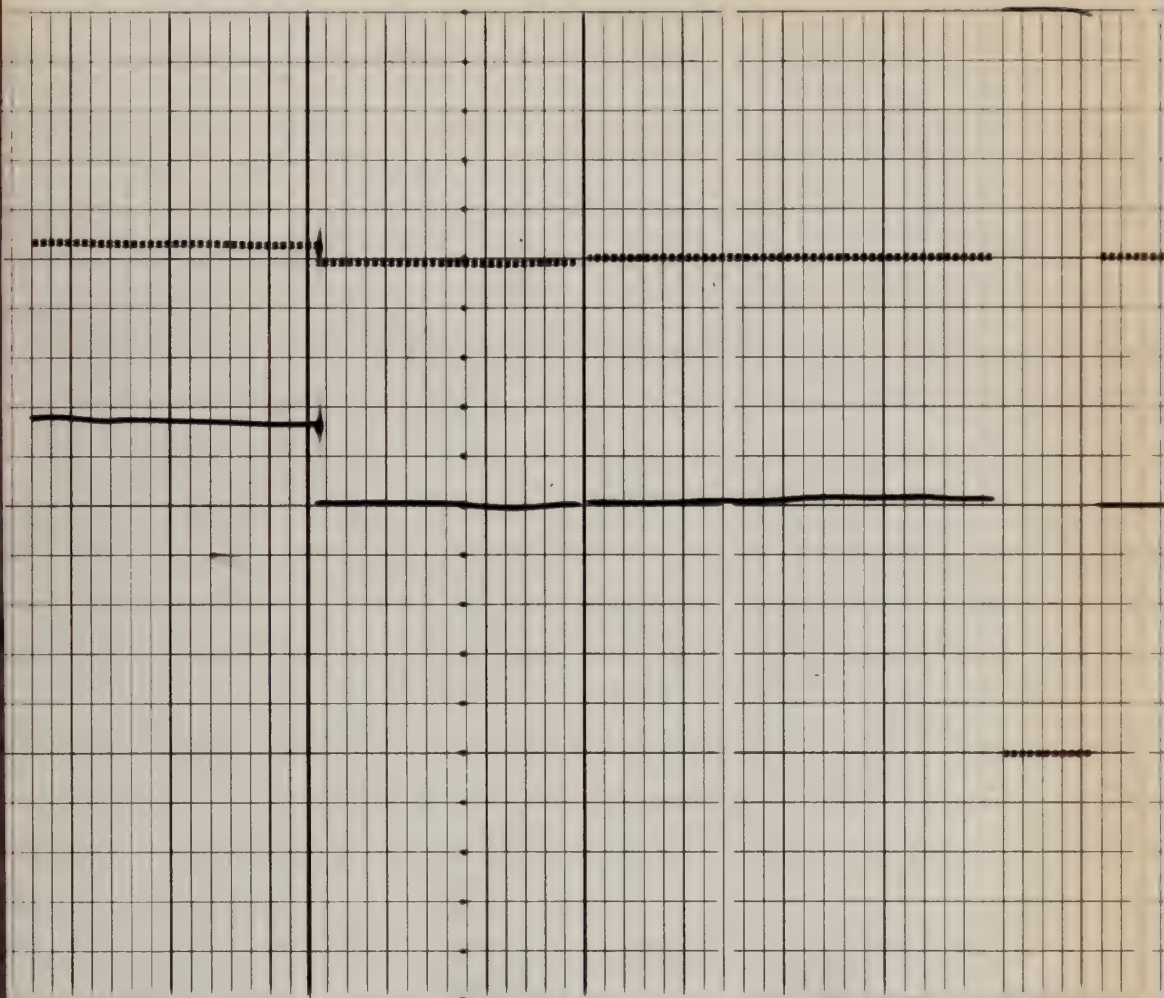
13

12

11

2

1



G. R. SURFACE CALIBRATION

6

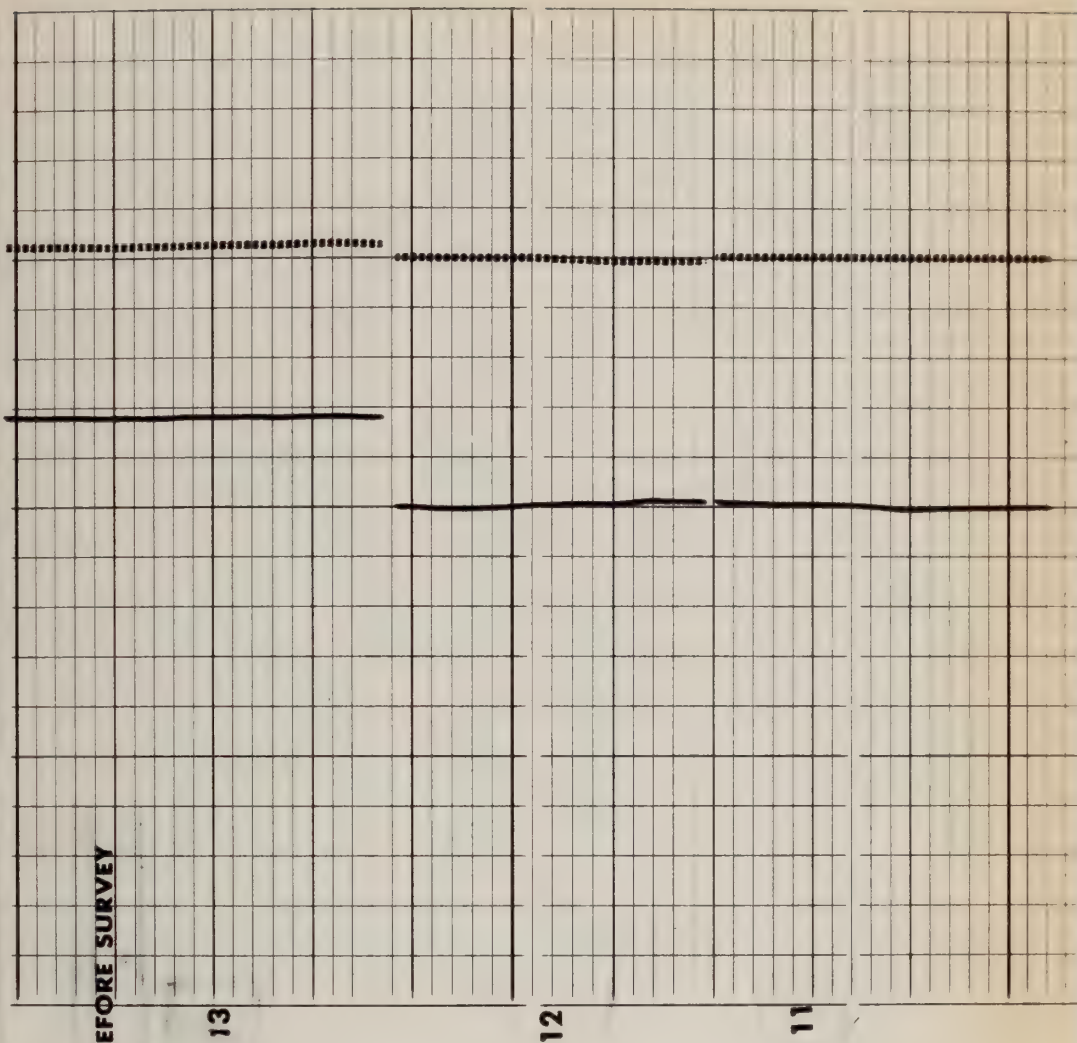
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4

3

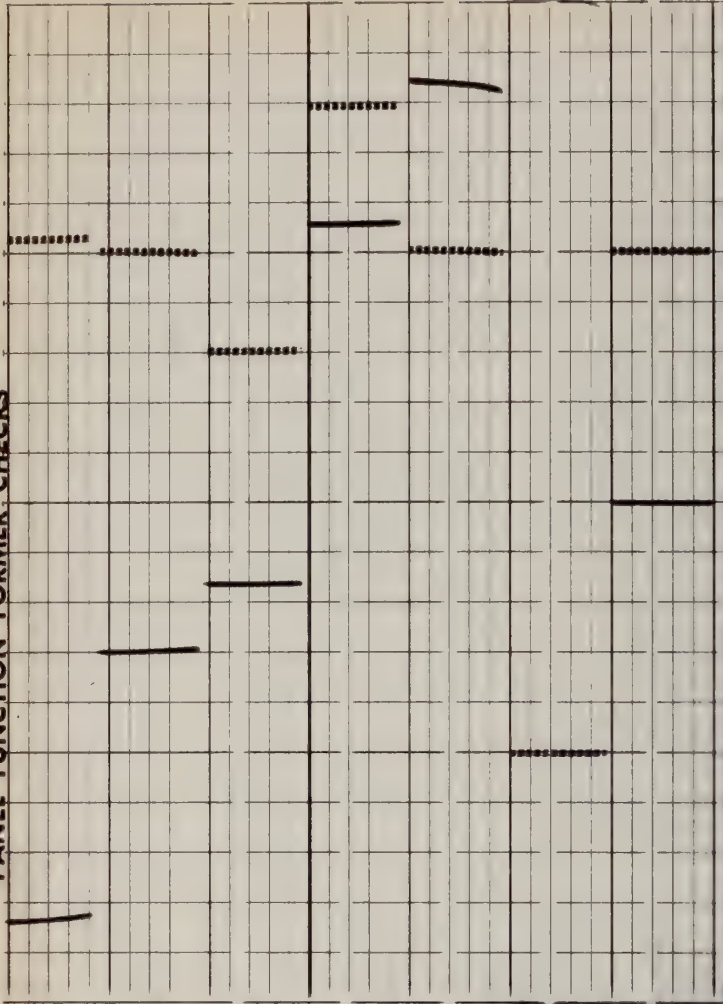
2

CALIBRATION BEFORE SURVEY



PANEL FUNCTION FORMER CHECKS

7
6
5
4
3
2
1

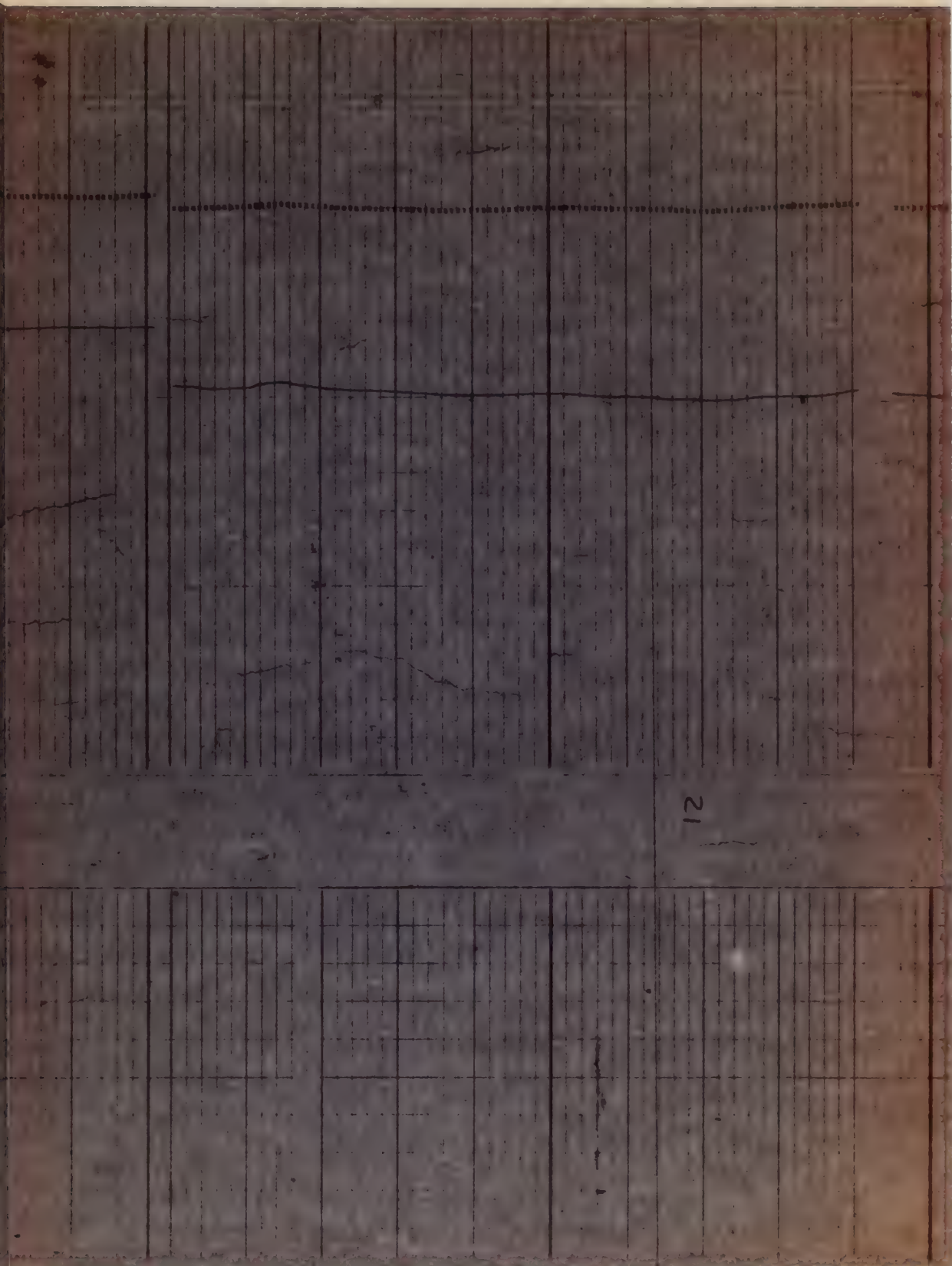


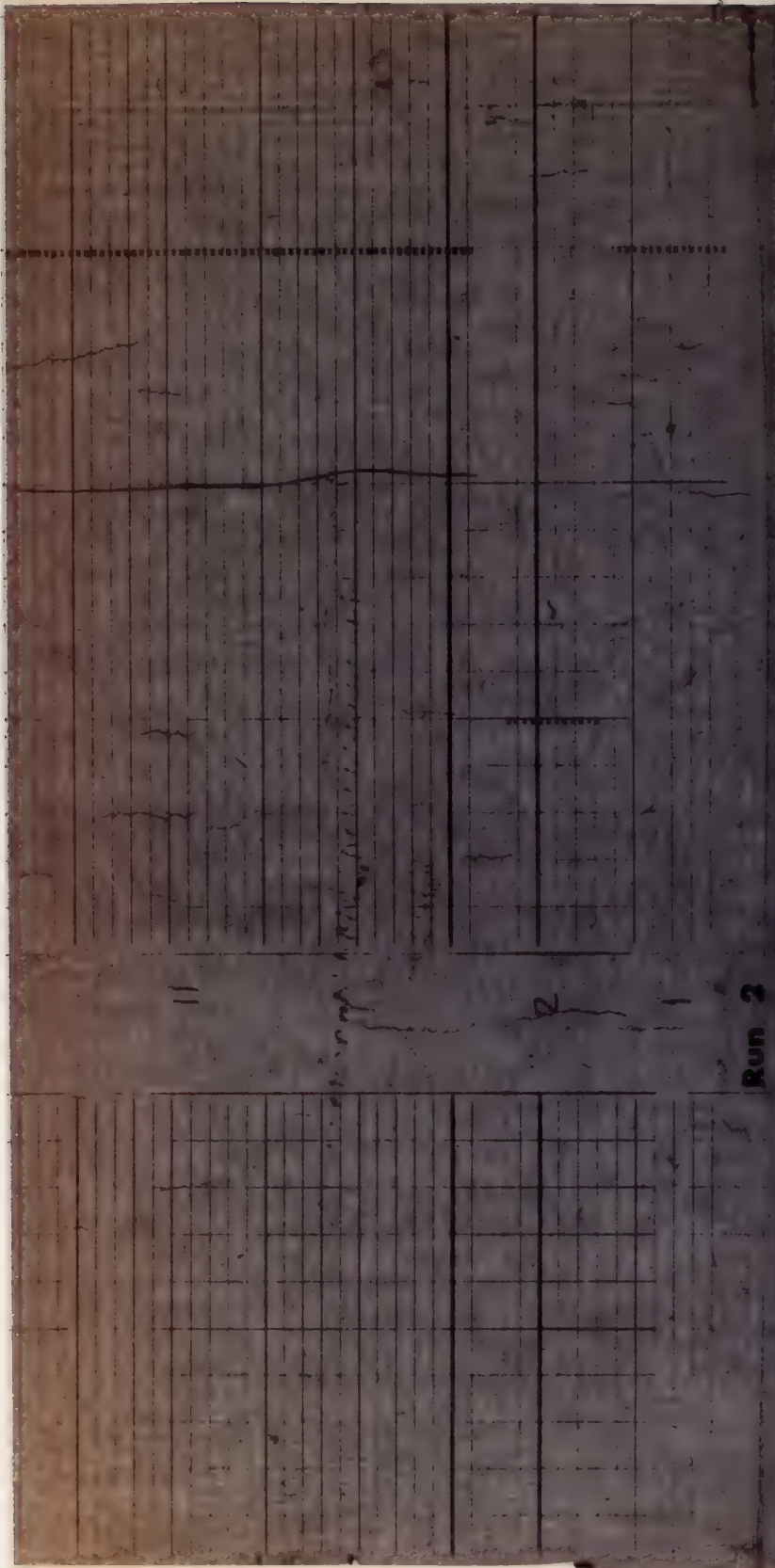
SHOP CAL

13

PPM-2 688
SFT 106 210
CS. 3098

POP-CA 161
P-132x4 P-205x4
5 JAN. 1975





FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

FDC LIQUID

POS	ρ	$\Delta\rho$
# 1	2.92	.00
# 2	2.78	+ .14
# 3	2.42	- .10
# 4	2.25	00

MECHANICAL ZERO CALIPER

8. 8" RING
9. 12" RING
10. TOOL CALIBRATE #1 SET $\rho = 2.50$
11. TOOL CALIBRATE #2 SET $\Delta\rho = .00$
12. LOG POSITION $\rho = 2.59$, $\Delta\rho = .015$
13.



CALIBRATION RECORD

COMPANY ATLANTIC RICHFIELD COMPANY
WELL SORGHUM GULCH 1-A
FIELD SORGHUM GULCH
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 1181
SCHL. TD 1182
DRLR TD 1180
Elev: KB
DF
GL

Schlumberger

OPEN HOLE AMPLITUDE AND VDL

COUNTY RIO BLANCO
FIELD or LOCATION SORGHUM GULCH
WELL SORGHUM GULCH 1-A
COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANYWELL SORGHUM GULCH 1-AFIELD SORGHUM GULCHCOUNTY RIO BLANCO STATE COLORADO

LOCATION

Sec. 2 Twp. 3S Rge. 97WOther Services:
BHC/FDC-GR
TEMP.
LL-7

Permanent Datum: GL, Elev. _____
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. _____
D.F. _____
G.L. _____

Date	2-1-75			
Run No.	ONE			
Depth—Driller	1180			
Depth—Logger	1182			
Btm. Log Interval	1173			
Top Log Interval	230			
Casing—Driller	7 @ 230	@	@	@
Casing—Logger	230			
Bit Size	6-1/4			
Type Fluid in Hole	FORMATION WATER			
Dens.	Visc.			
pH	Fluid Loss	ml	ml	ml
Source of Sample				
R _m @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
R _{mf} @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
R _{mc} @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: R _{mf} R _{mc}				
R _m @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.				
Max. Rec. Temp.	°F	°F	°F	°F
Equip. Location	5602 GJ			
Recorded By	GEIGER			
Witnessed By	POWERS			

FOLD HERE

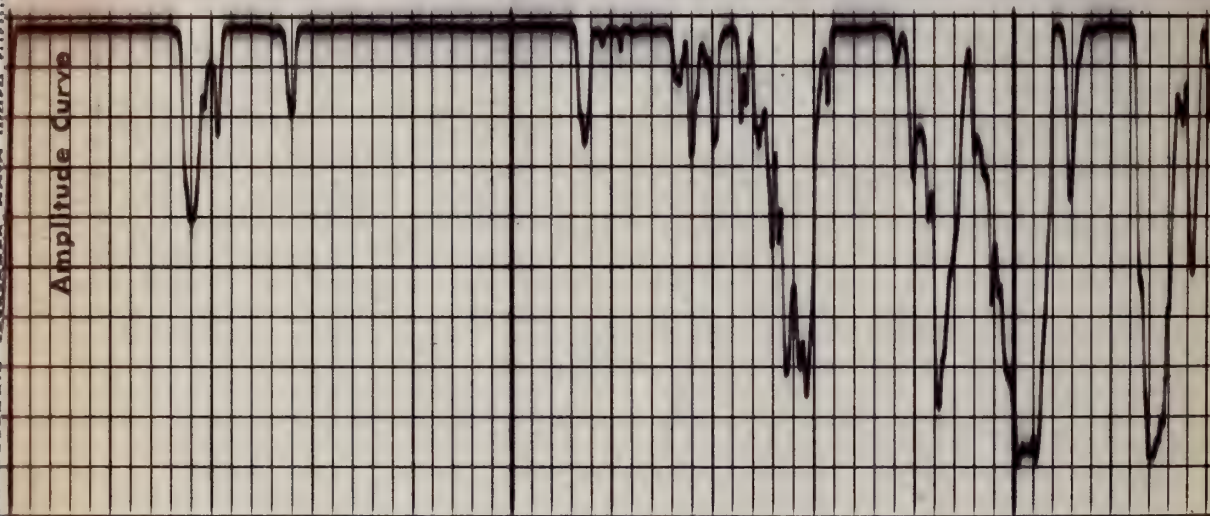
CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES					SCALE CHANGES			
Date	Sample No.				Type Log	Depth	Scale Up Hole	Scale Down Hole
Depth - Driller								
Type Fluid in Hole								
Dens.	Visc.							
ph	Fluid Loss		ml					
Source of Sample								
Rm @ Meas. Temp.		@	°F	@				
Rm @ Meas. Temp.		@	°F	@				
Rm @ Meas. Temp.		@	°F	@				
Source: Rmf								
Rm @ BHT		@	°F	@				
Rm @ BHT		@	°F	@				
Rm @ BHT		@	°F	@				

EQUIPMENT DATA

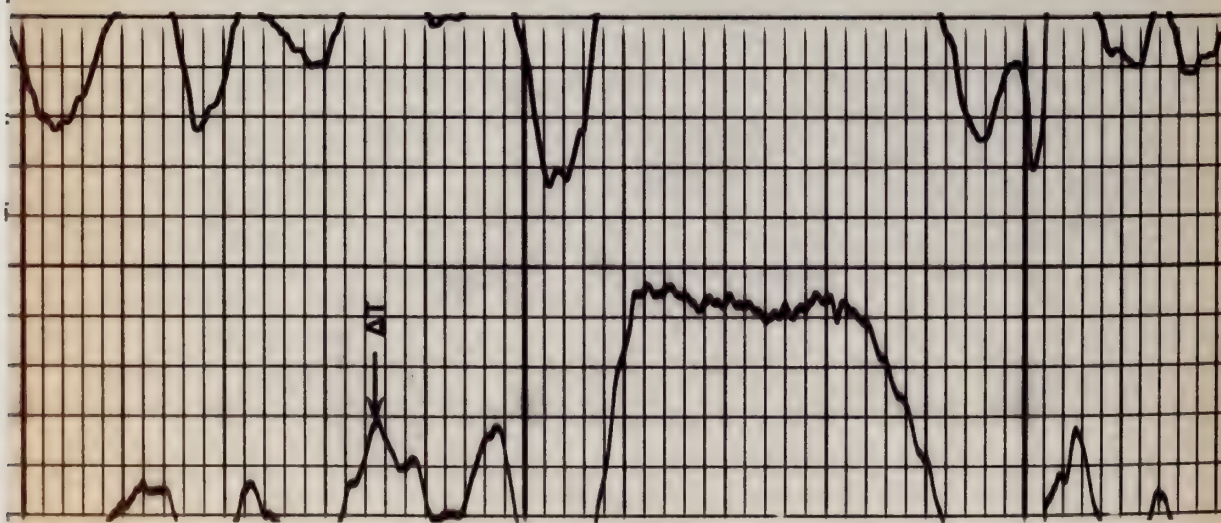
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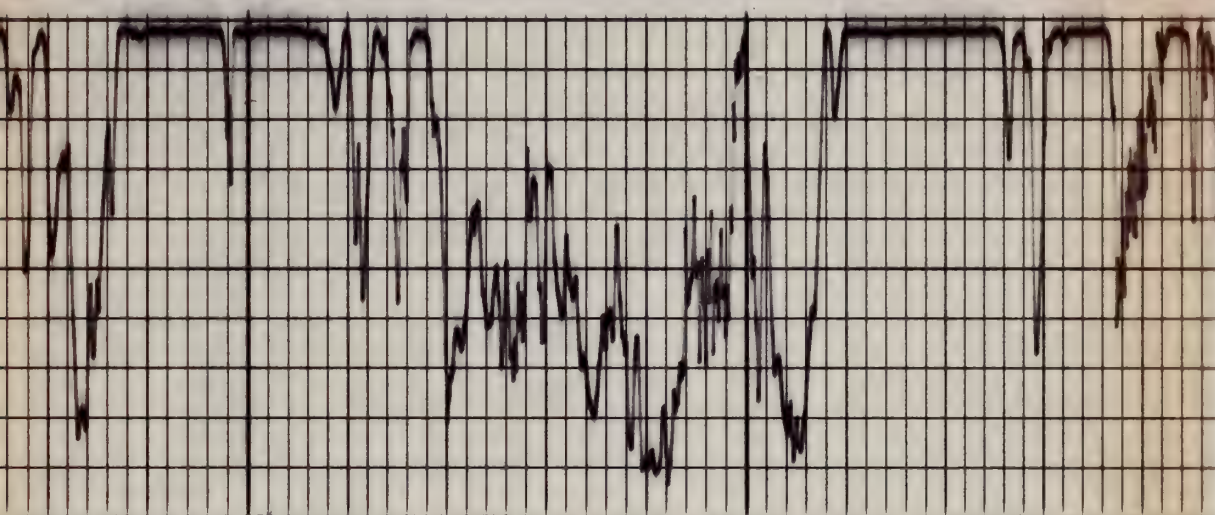
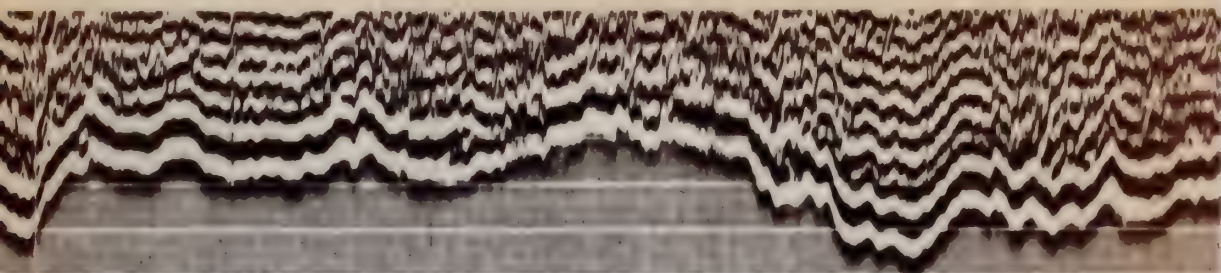
CALIBRATIONAL DATA

三

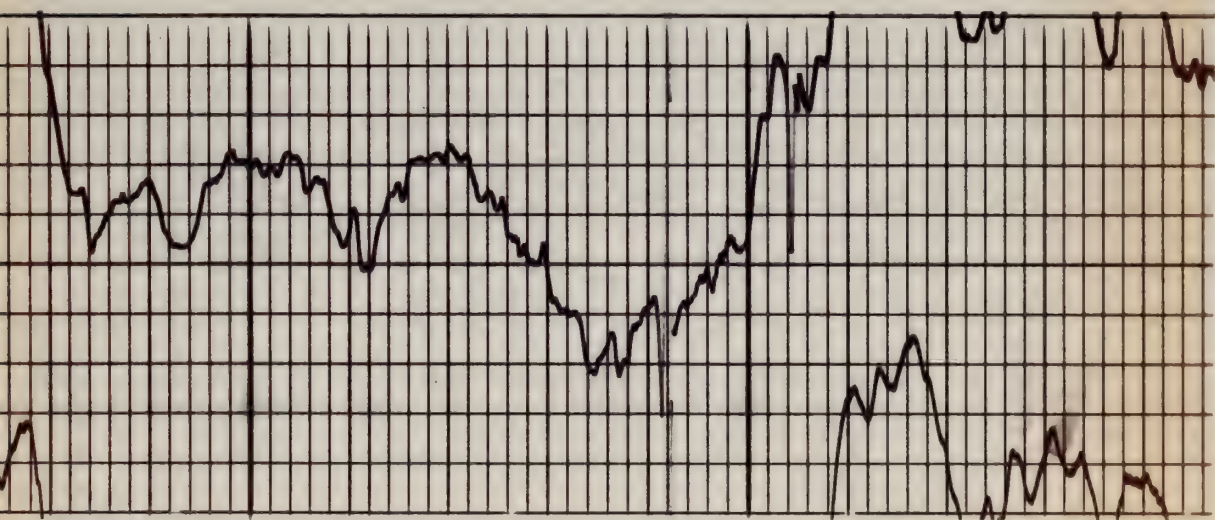


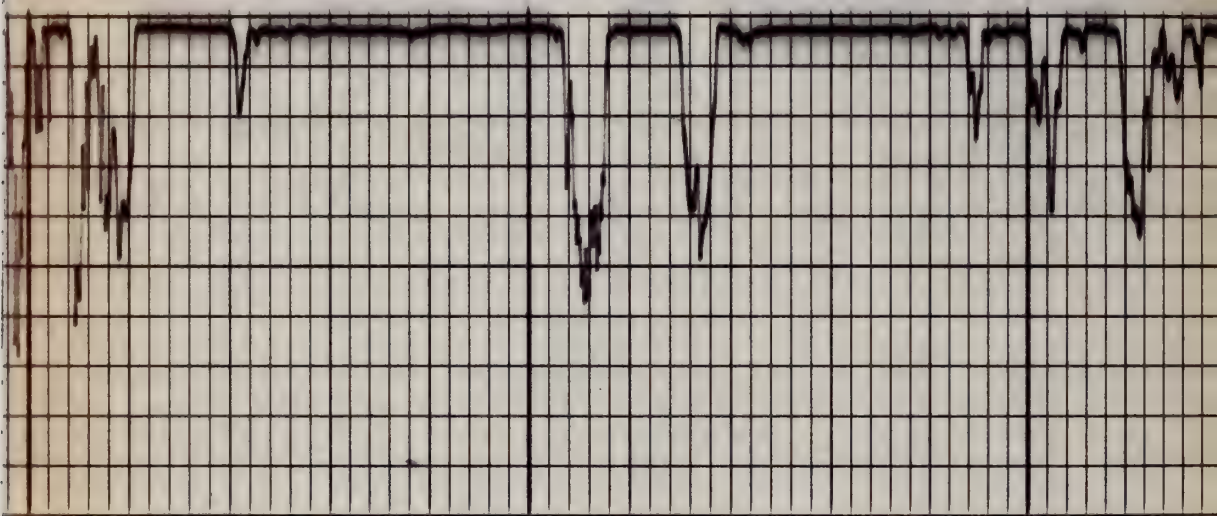
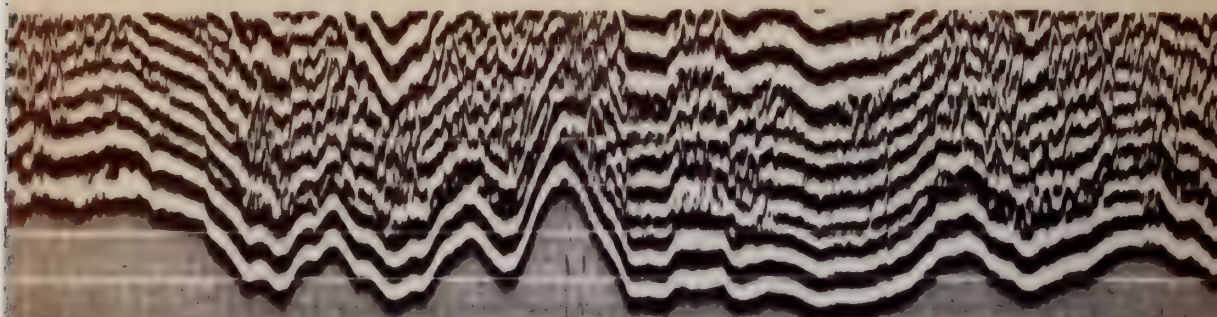
0300





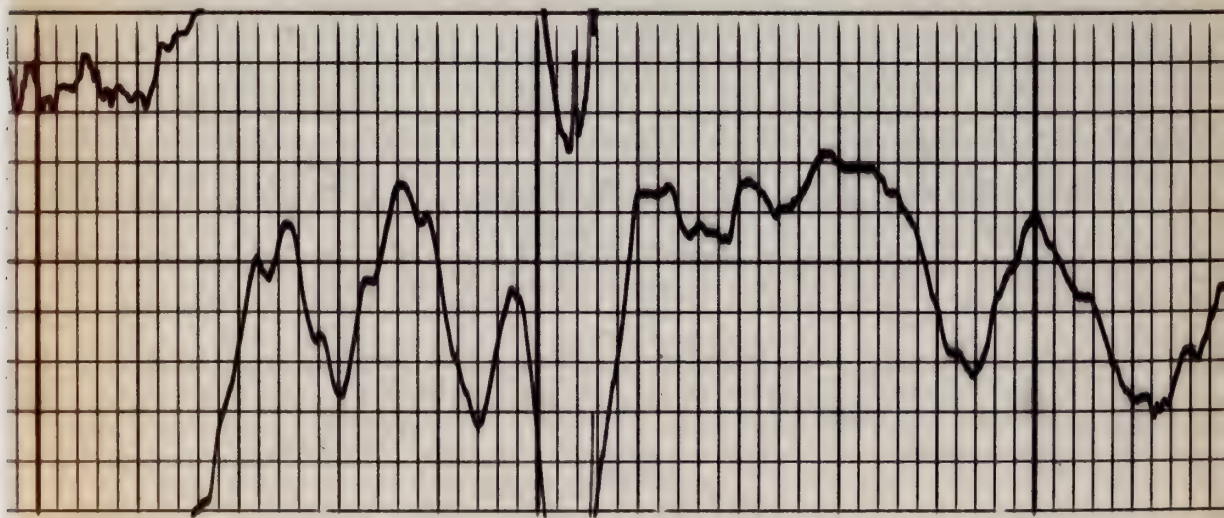
0400

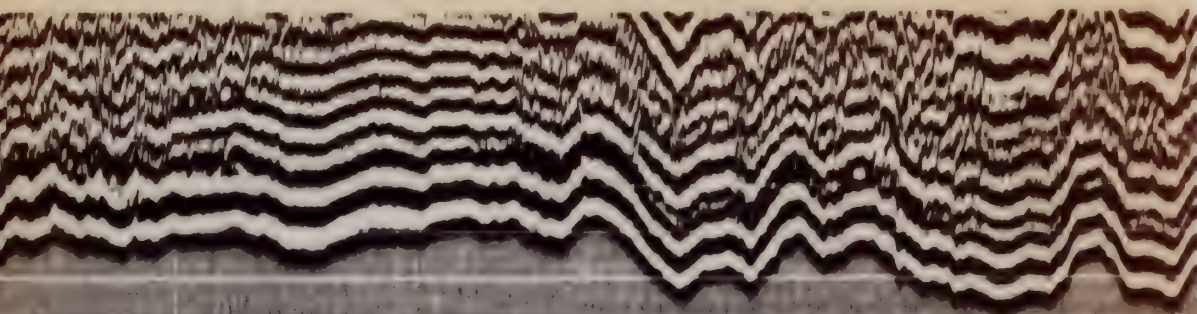




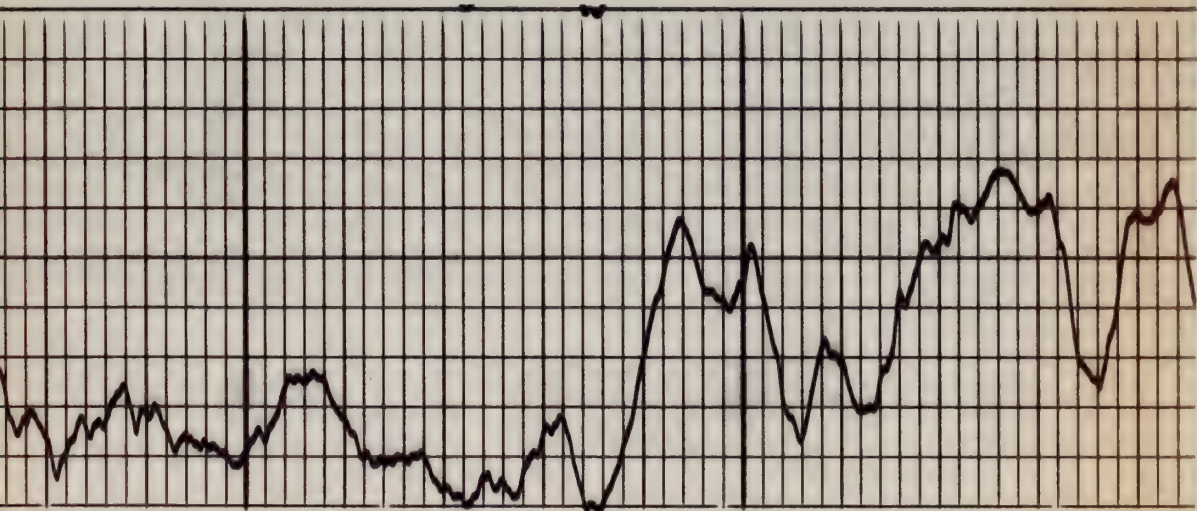
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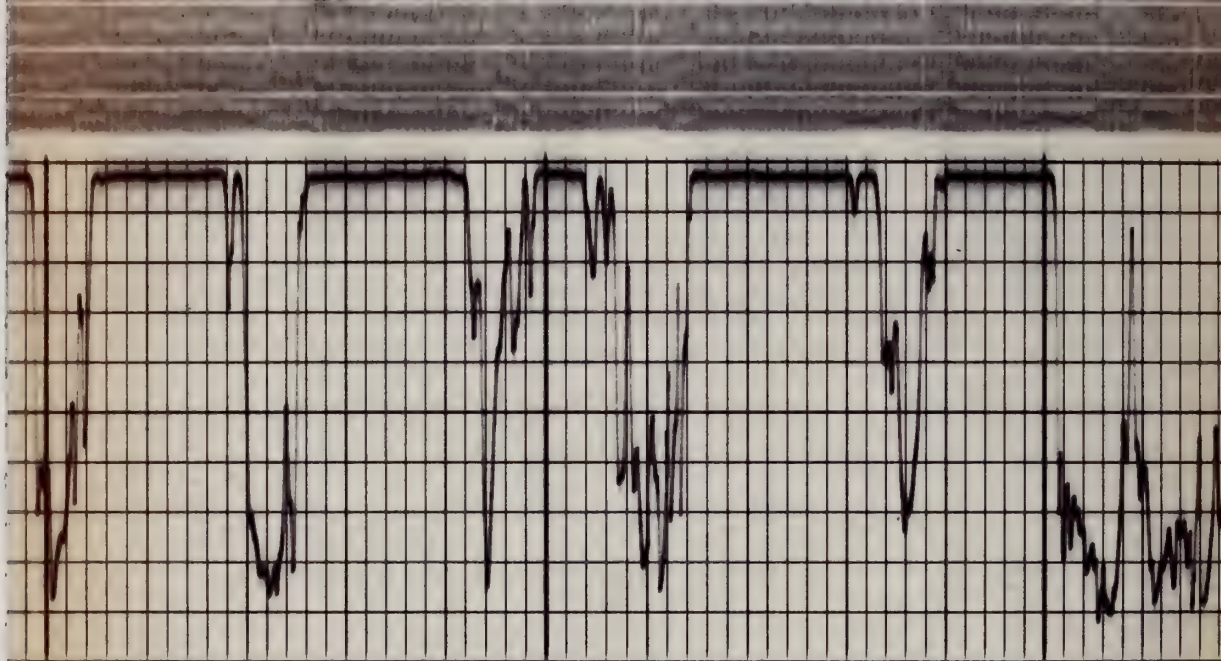
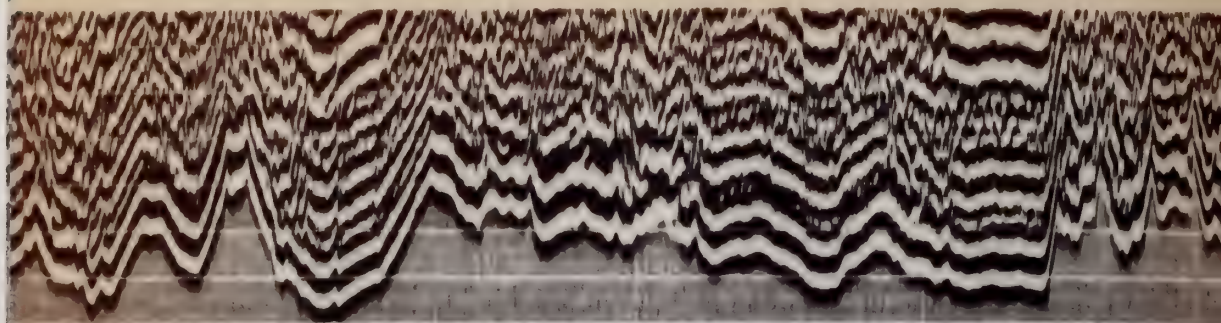
0600



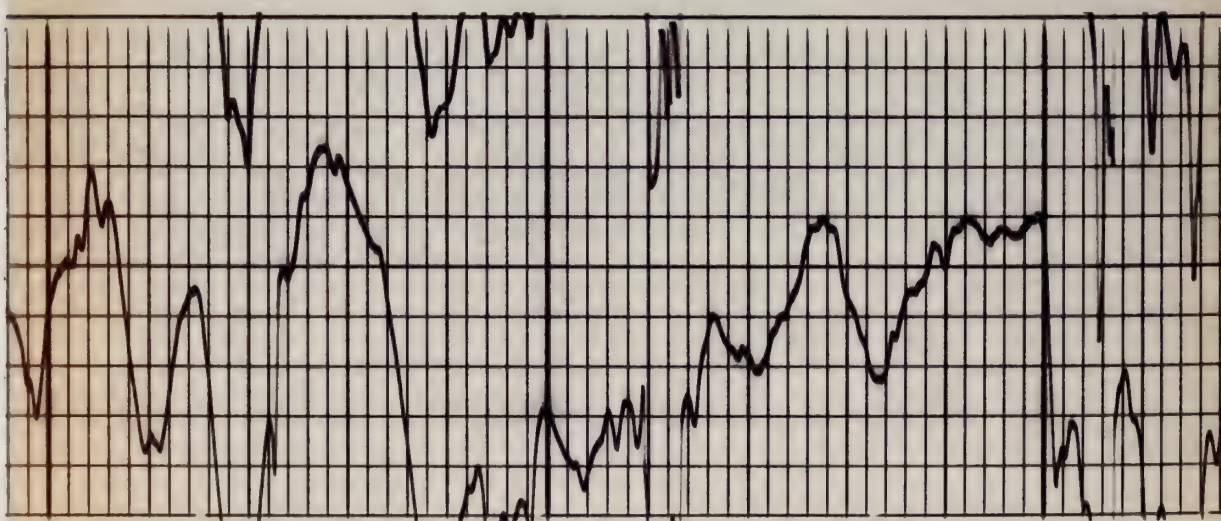


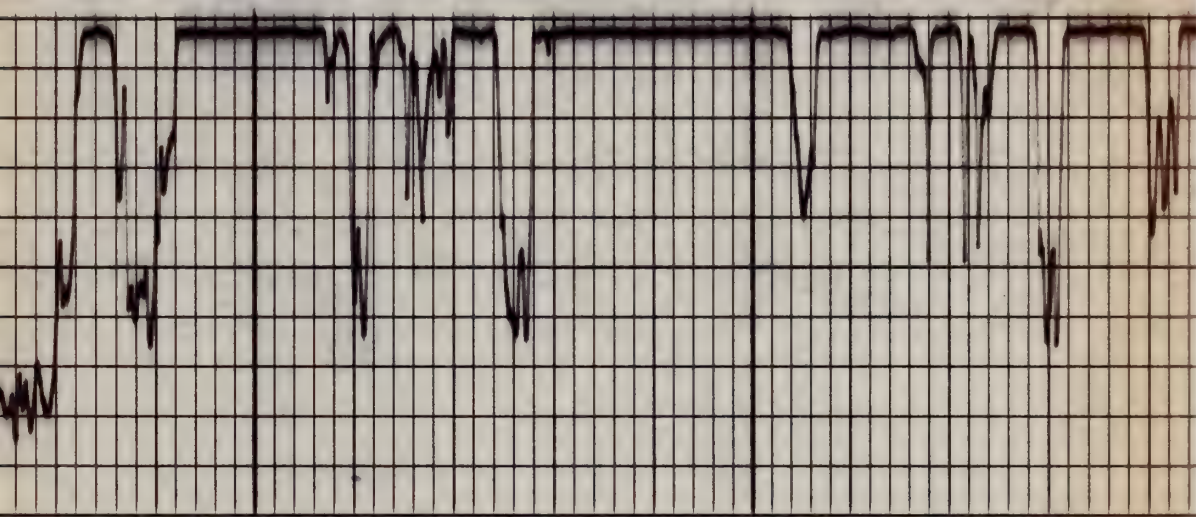
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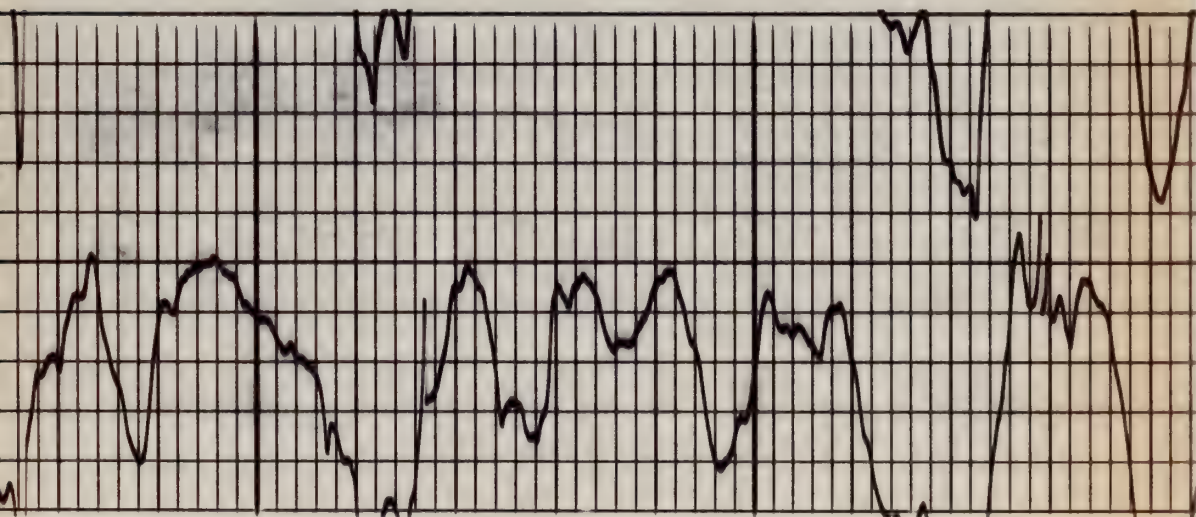


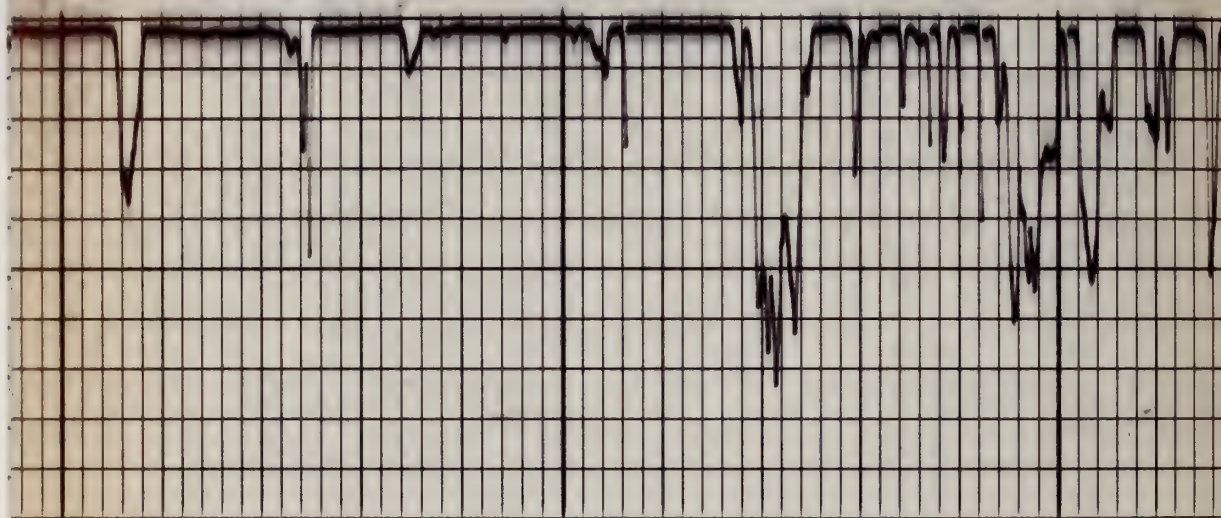
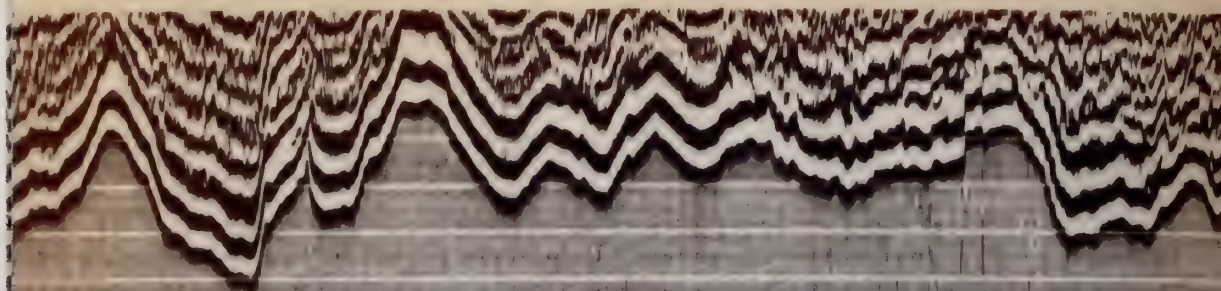
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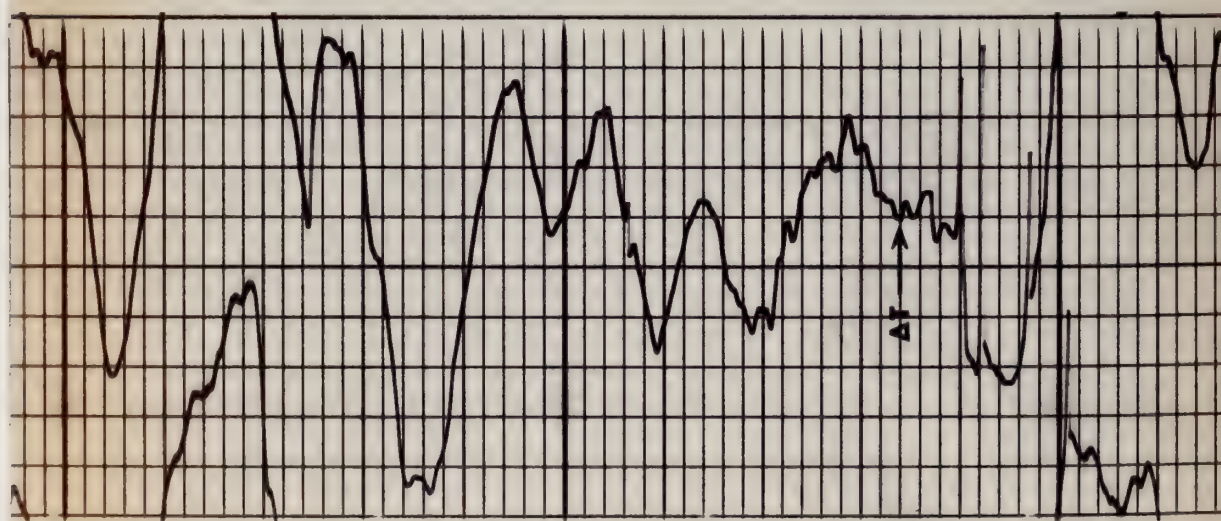
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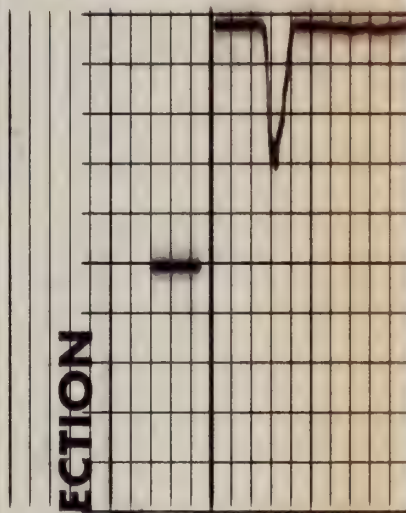
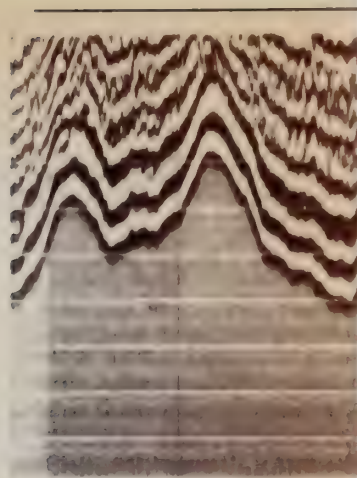
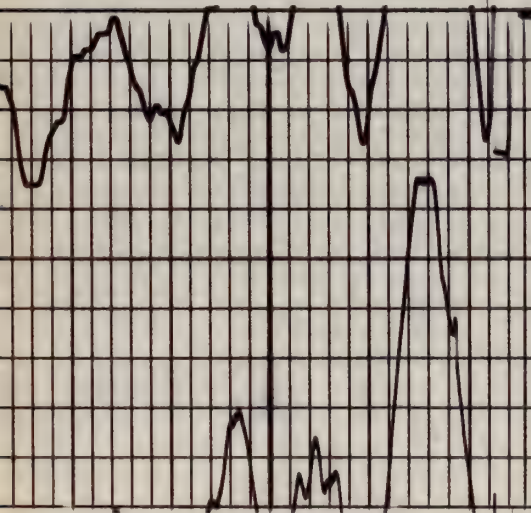
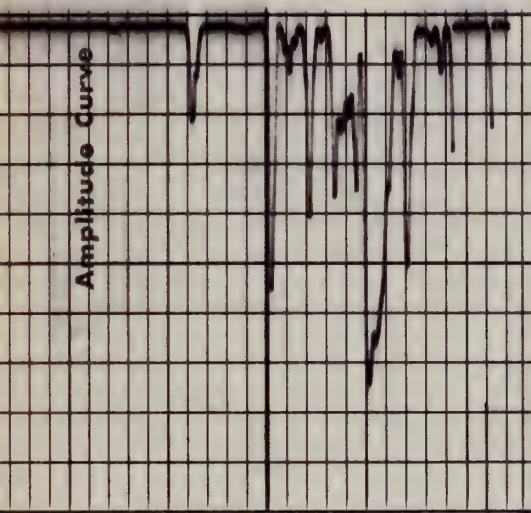
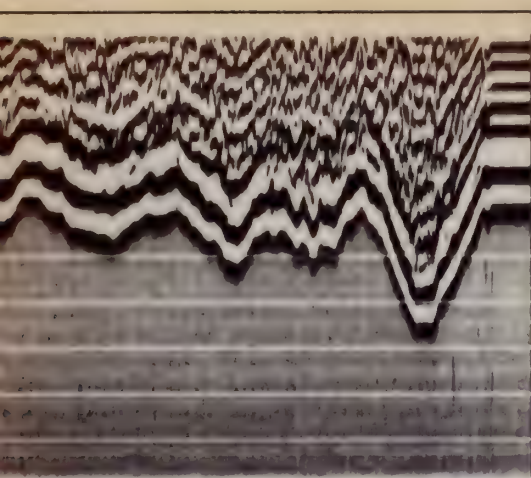




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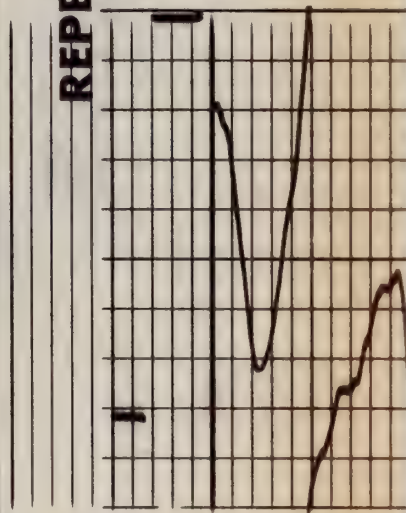
1100

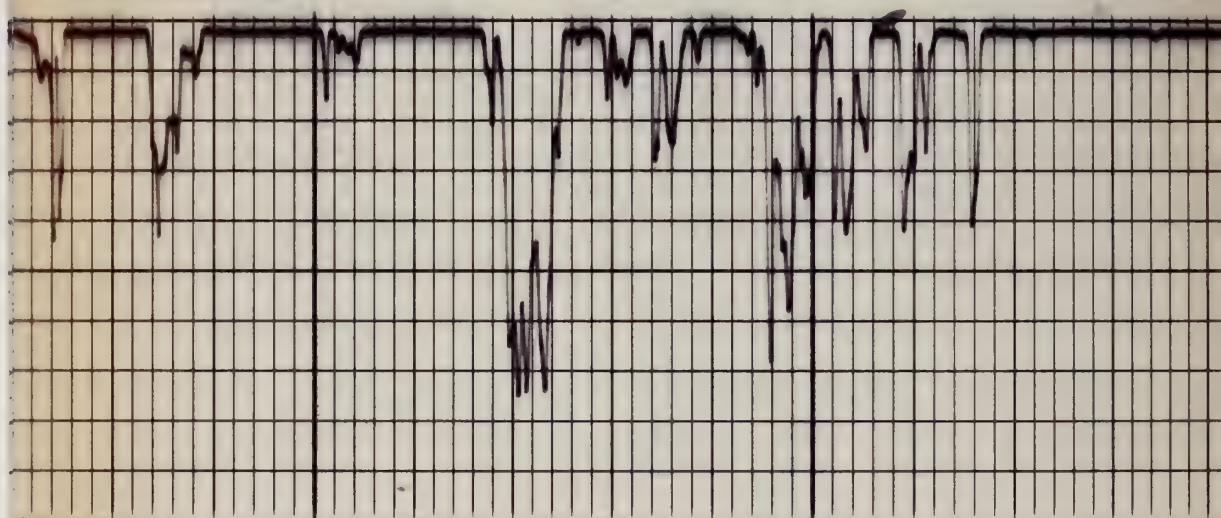
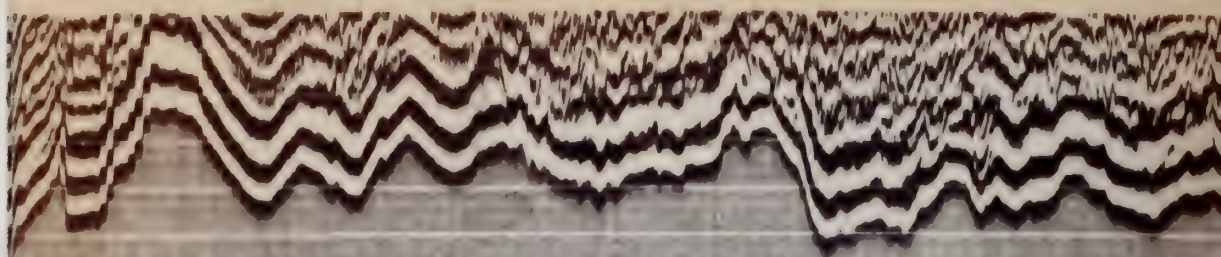




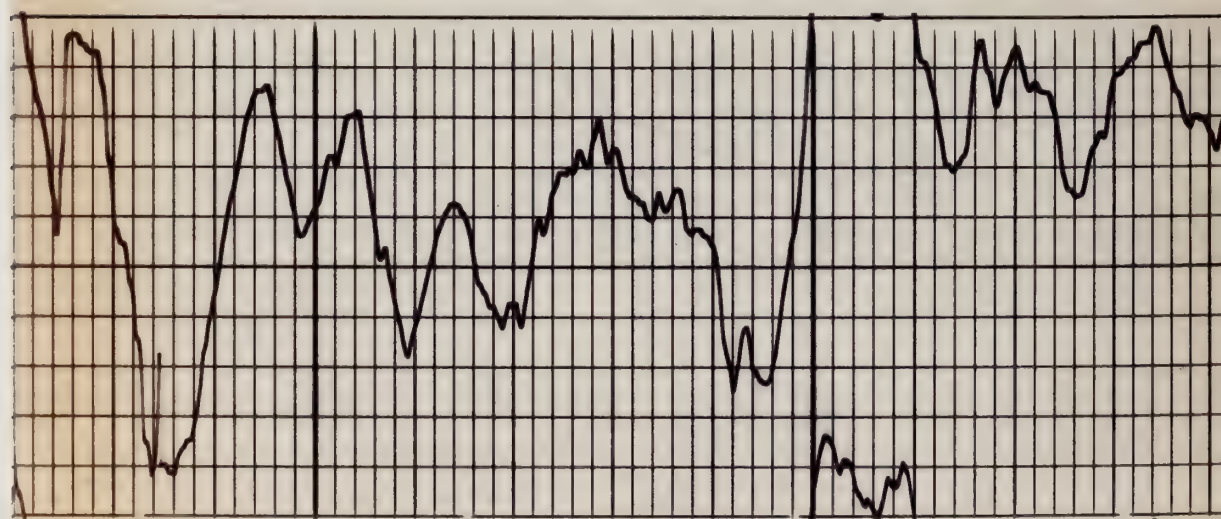
REPEAT SECTION

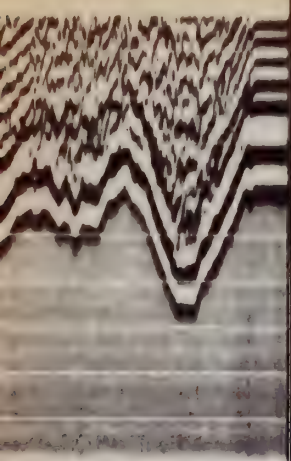
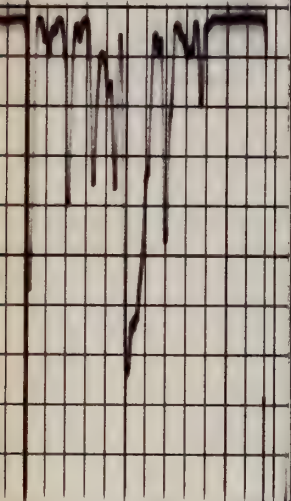
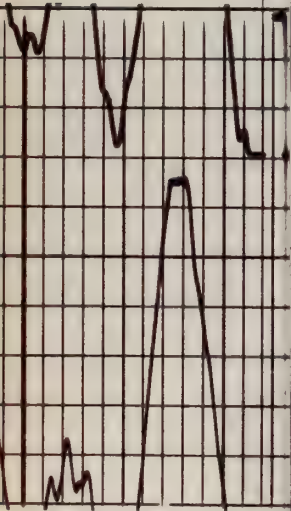
1000





1100





SINGLE RECIEVER DELTA-T	DEPTHS	AMPLITUDE	VARIABLE DENSITY
600	400	0	1200
800	600		

COMPANY ATLANTIC RICHFIELD COMPANY

SCHL FR 1173

WFI1 SORGHUM GULCH 1-A

SCHL TD 1182

DRLR TD 1180

11222

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Elev:

KB
DF
GL

Schlumberger

TEMPERATURE LOG

COUNTY RIO BLANCO
 FIELD or LOCATION SORGHUM GULCH
 WELL SORGHUM GULCH 1-A
 COMPANY ATLANTIC RICHFIELD

COMPANY ATLANTIC RICHFIELD COMPANYWELL SORGHUM GULCH 1-AFIELD SORGHUM GULCHCOUNTY RIO BLANCO STATE COLORADO

LOCATION

Sec. 2 Twp. 3S Rge. 97W
 Other Services:
 BHC/FDC-GR
 LL-7
 AMP-VDL

 Permanent Datum: GL; Elev.: _____
 Log Measured From GL, 0 Ft. Above Perm. Datum
 Drilling Measured From GL

 Elev.: K.B. _____
 D.F. _____
 G.L. _____

Date	2-1-75			
Run No.	ONE			
Depth-Driller	1180			
Depth-Logger	1180			
tm. Log Interval	1180			
op Log Interval	SURF			
Casing-Driller	7 @ 230	@	@	
Casing-Logger	230			
Casing Size	1 To	To	To	
	2 To	To	To	
Casing Weight	1			
	2			
Casing Thickness	1			
	2			
Bit Size	1 6-1/4 To 1180	To	To	
	2 To	To	To	
Type Fluid in Hole	FORMATION WATER			
Dens.	Visc.			
Time Since Circ.				
BHT				
Equip.	Location	5602 GJ		
Recorded By	GEIGER			
Witnessed By				

Elev: 112

the well name, location and borehole reference data were furnished by the customer.

REMARKS:

S0# 22443

HRT FROM FT. MORGAN

CEMENTATION DATA

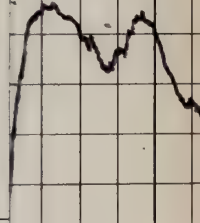
[illegible]

REDUCED SENSITIVITY TEMPERATURE

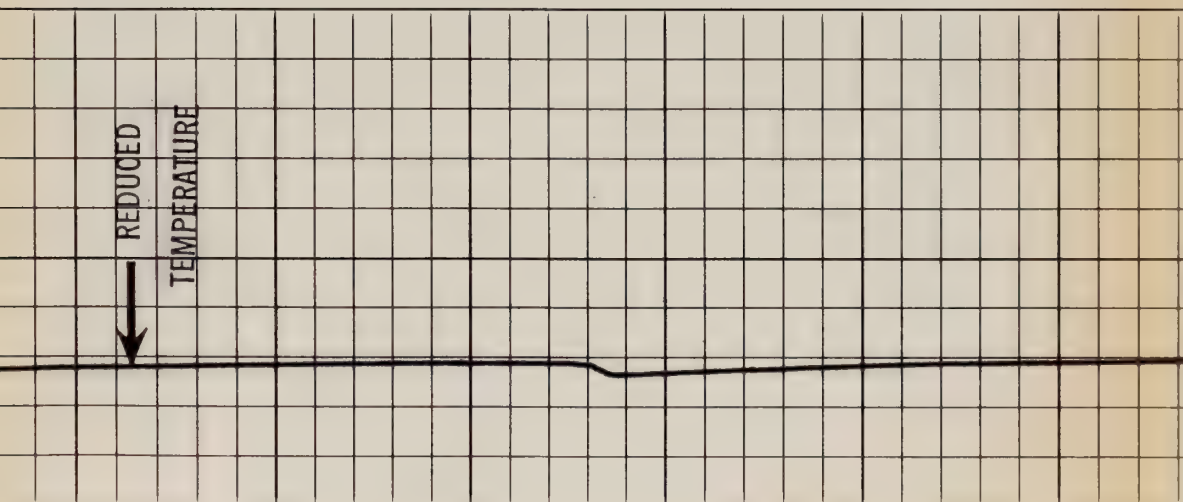
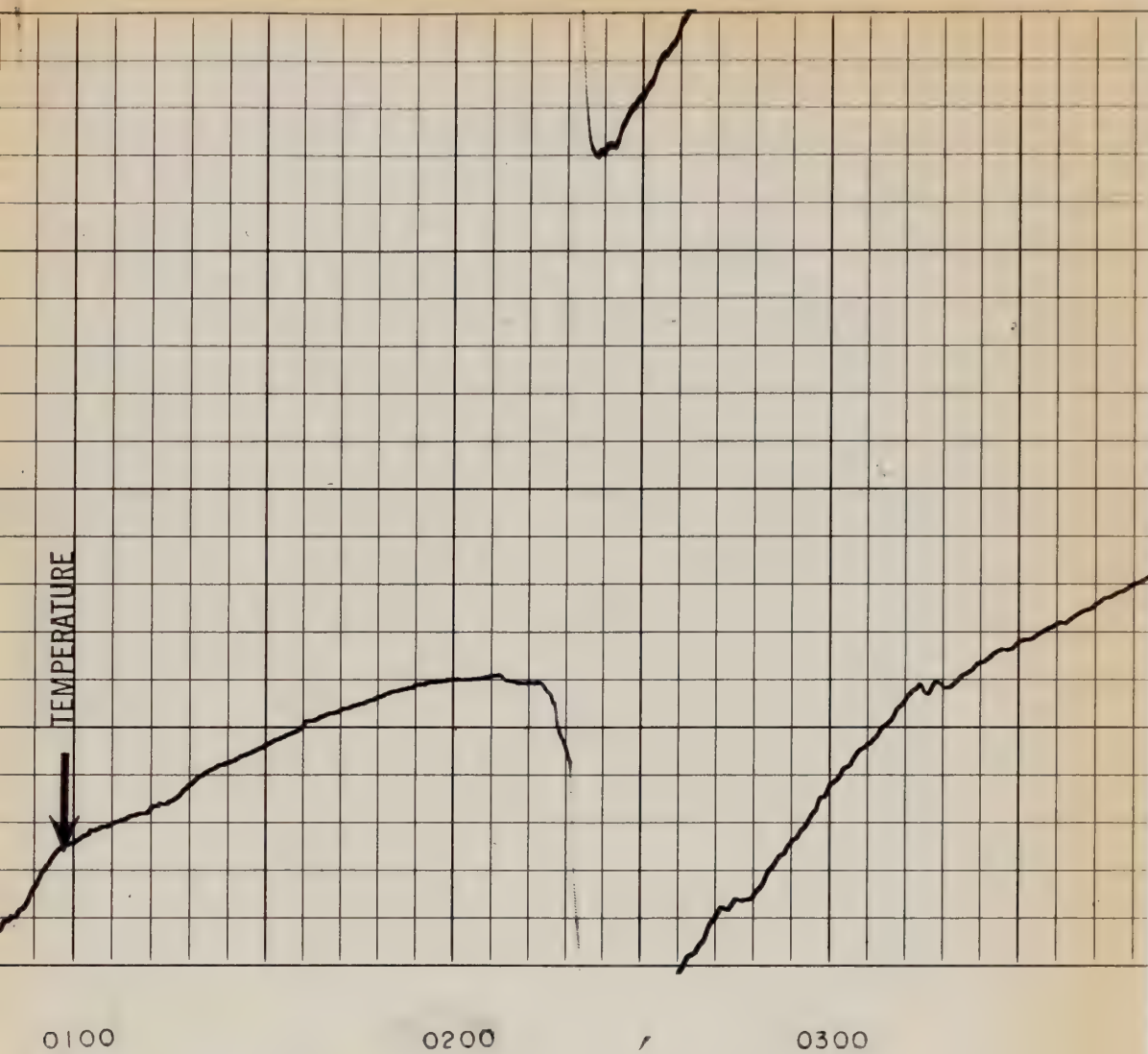
TEMPERATURE ° F.

40

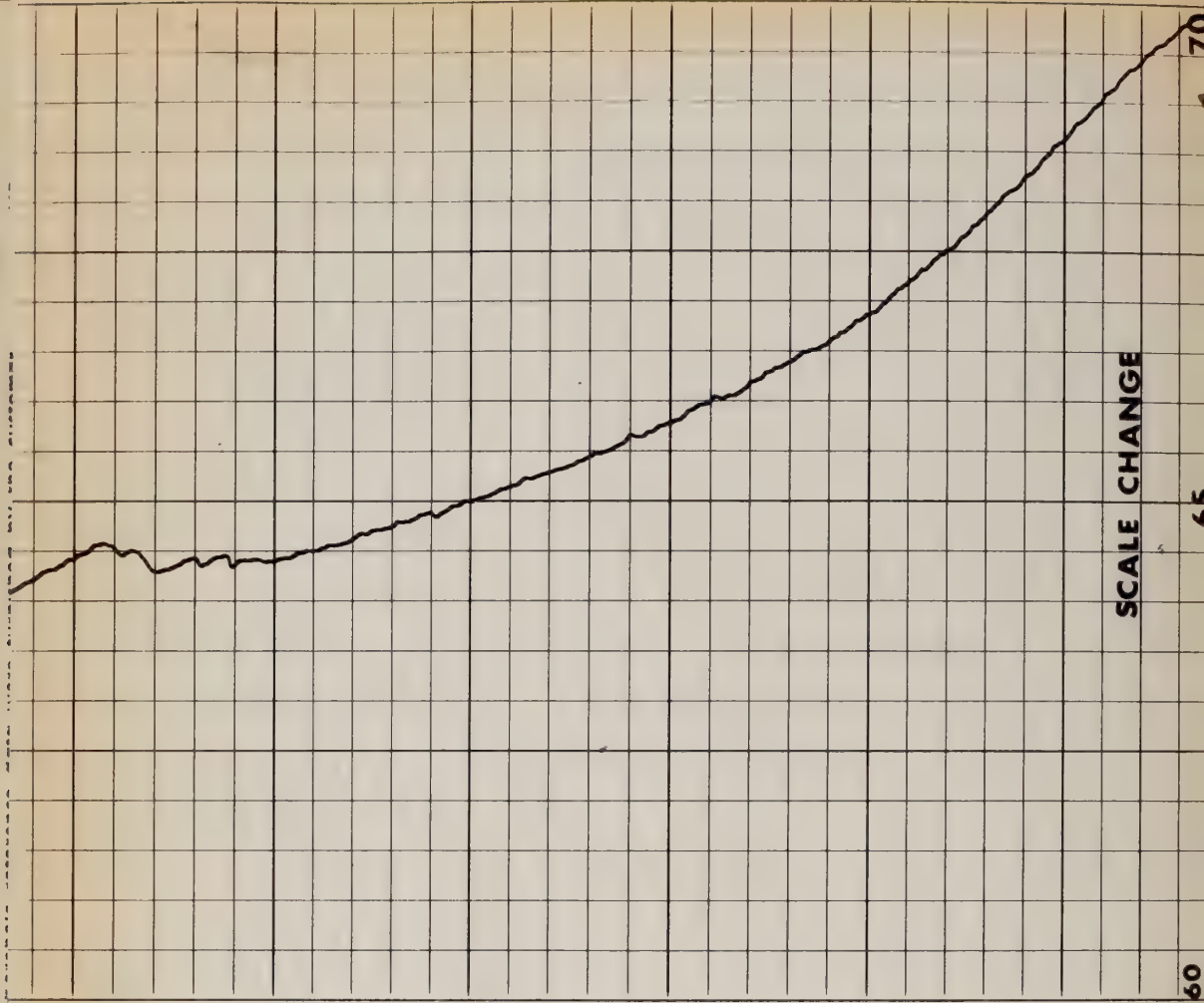
50



SCALE CHANGE



Elev:

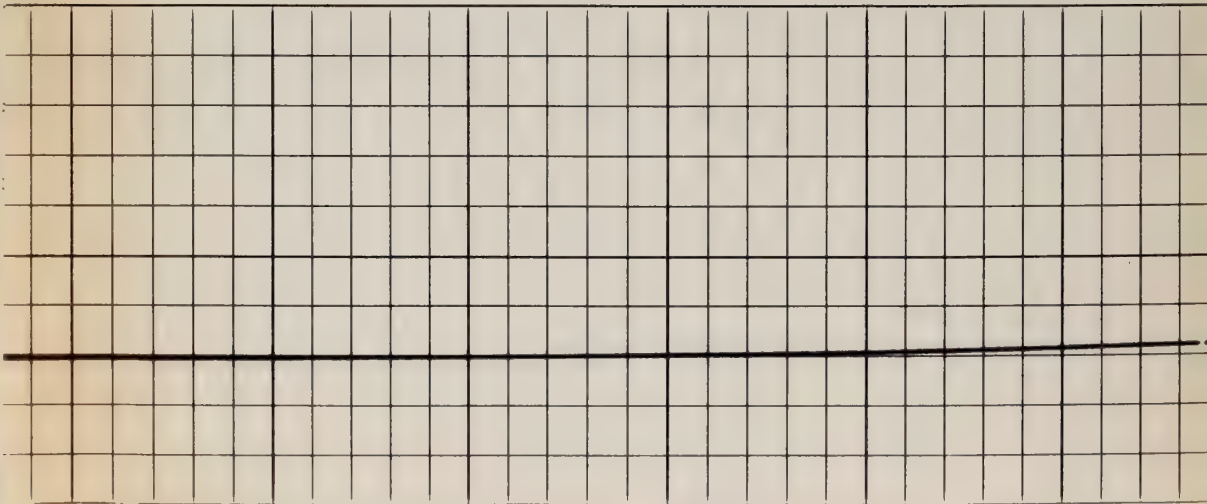


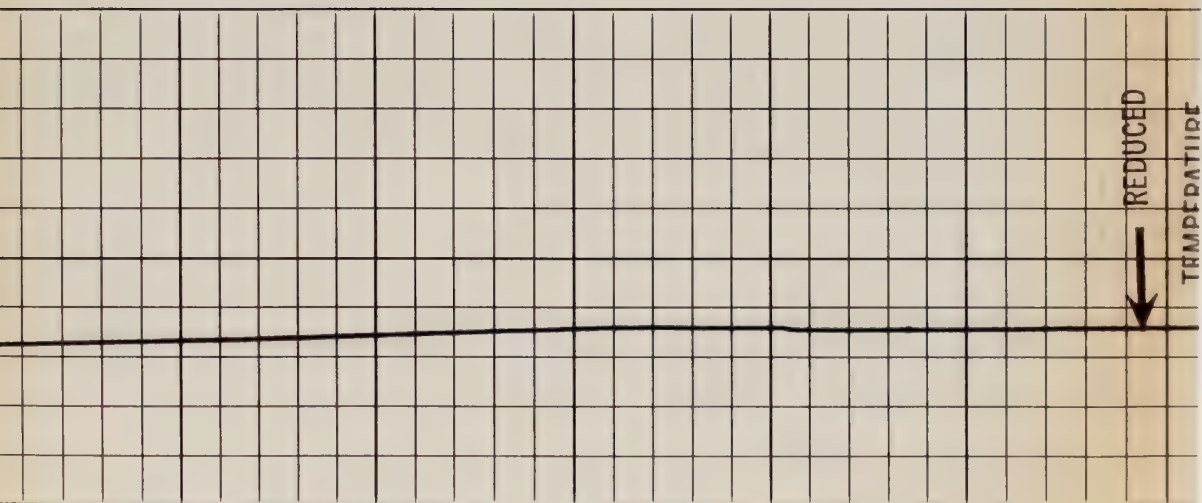
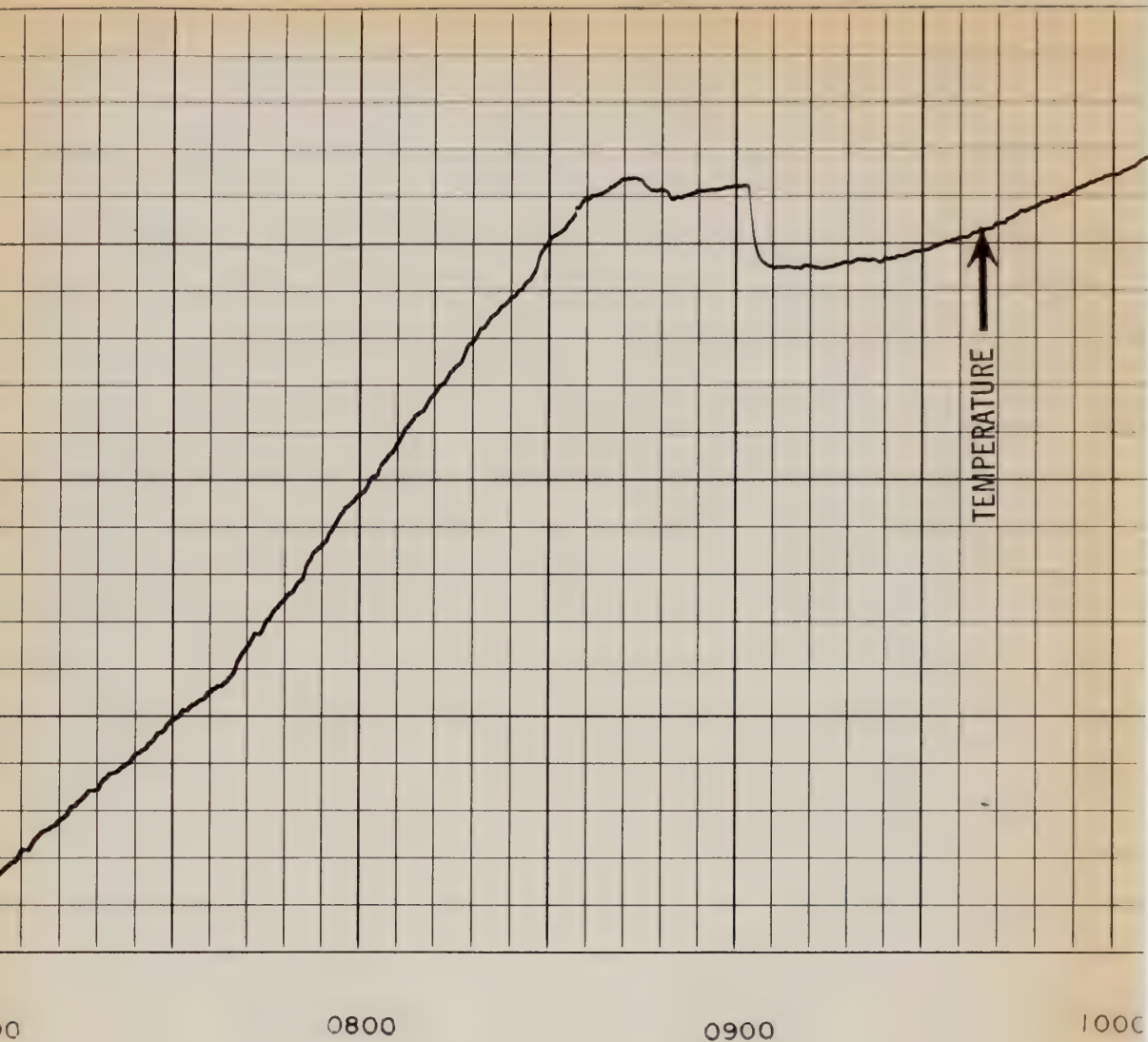
SCALE CHANGE

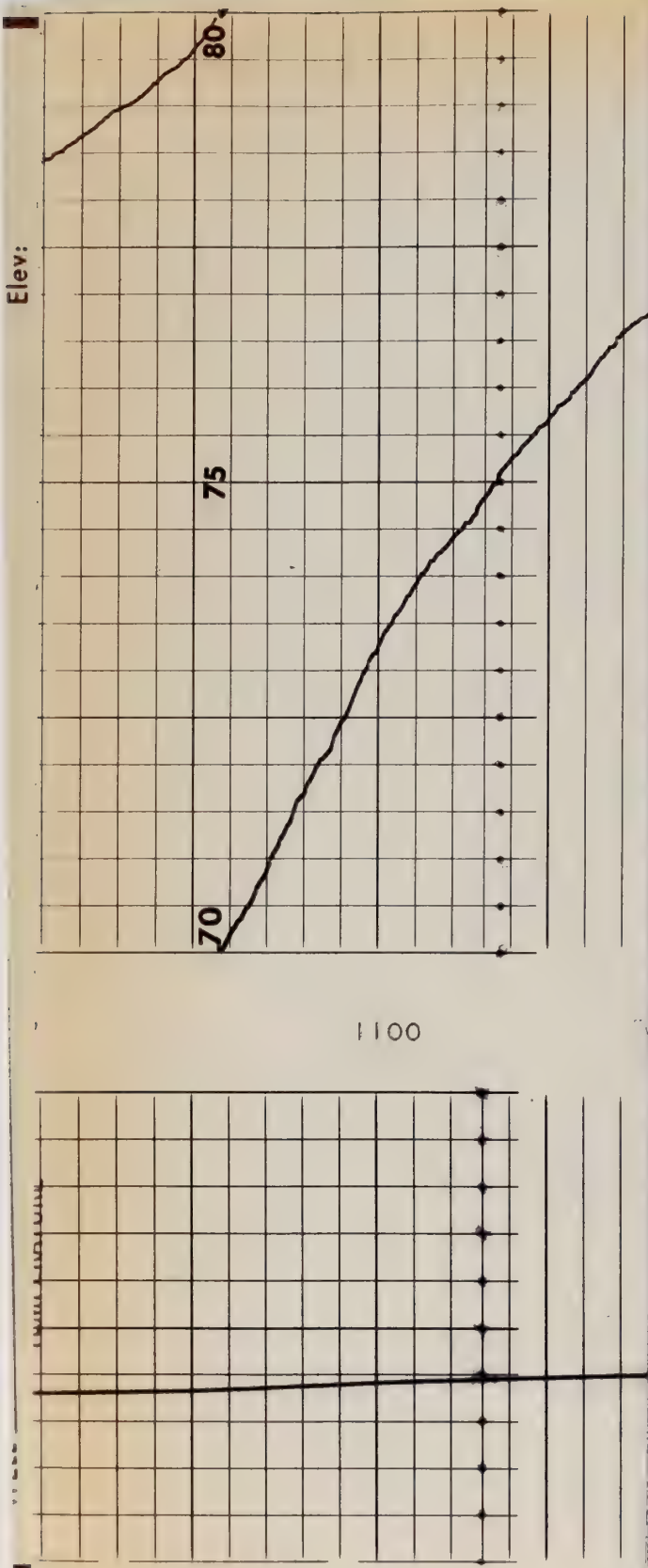
0400

0500

0600



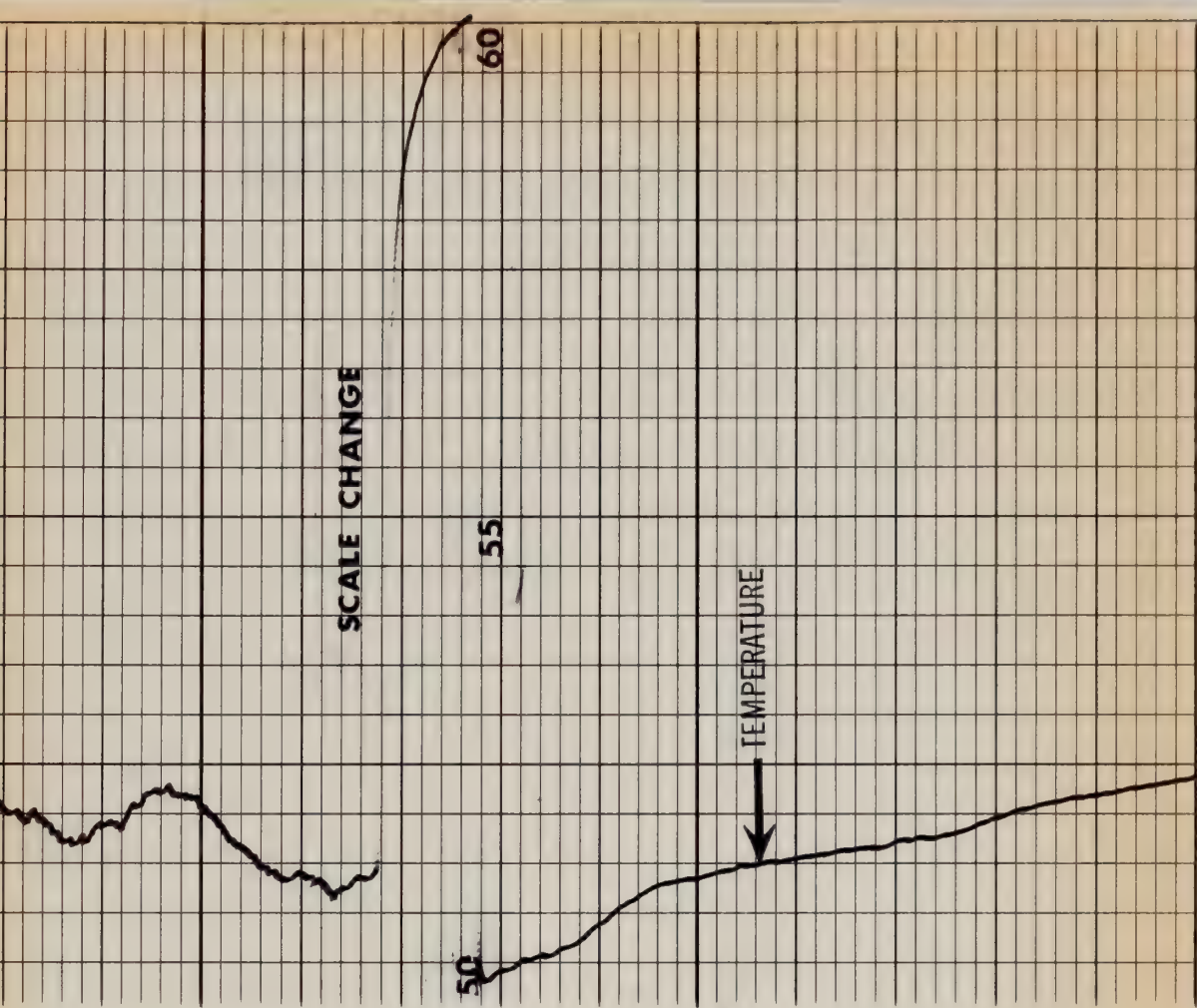
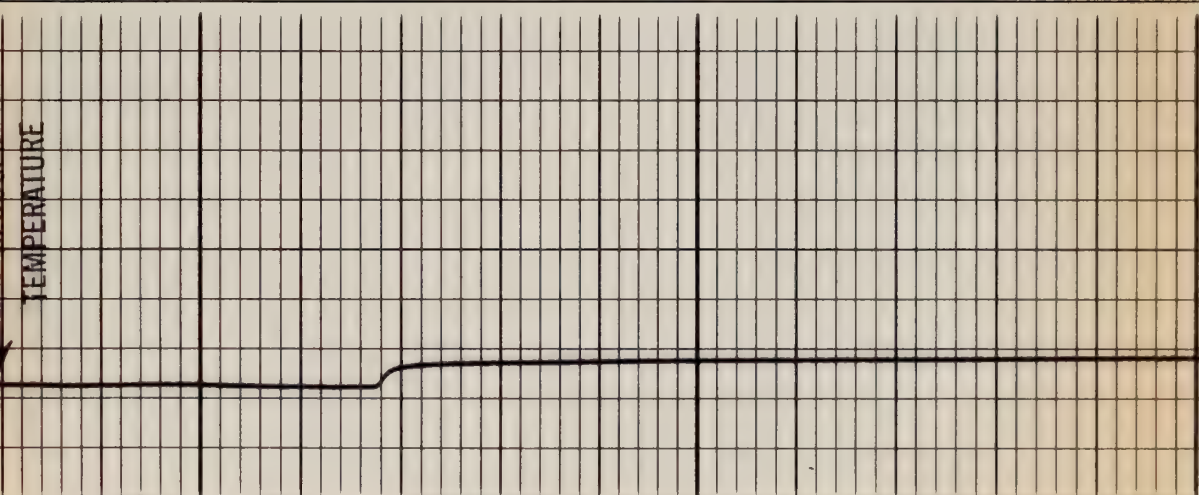




DETAIL LOG

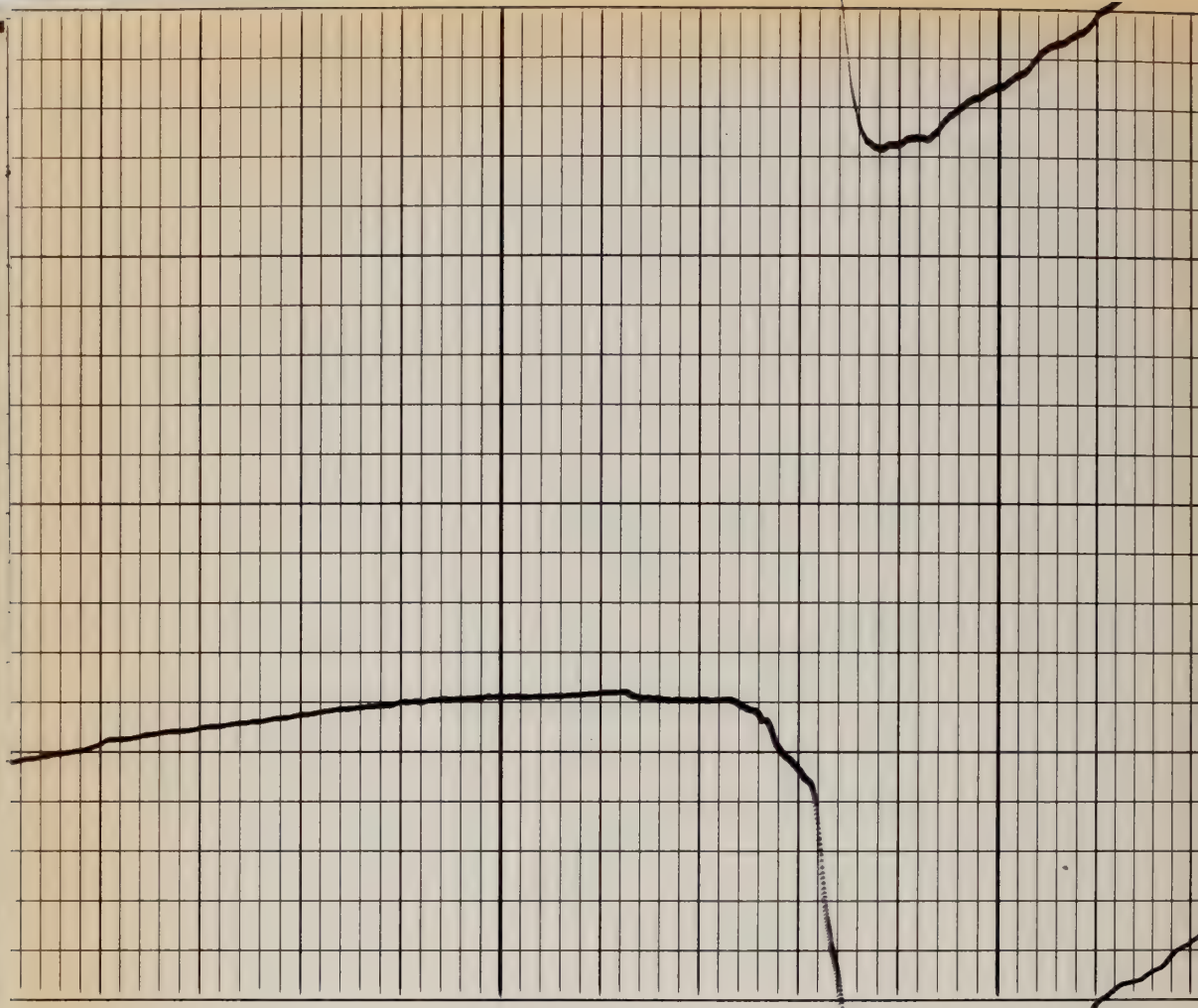
5" = 100'

REDUCED SENSITIVITY TEMPERATURE	DEPTHS	TEMPERATURE °F.
		50
		40

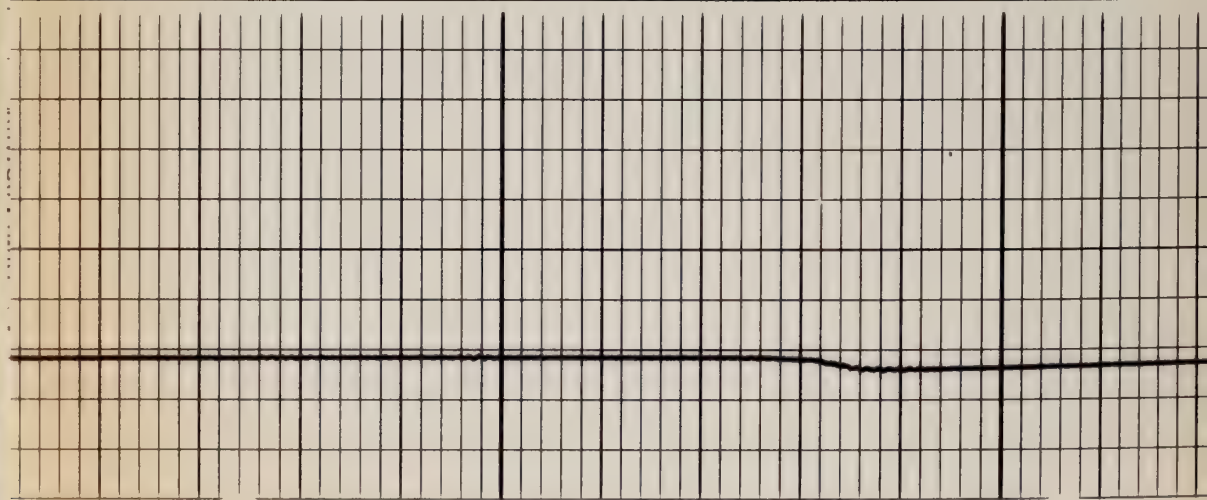


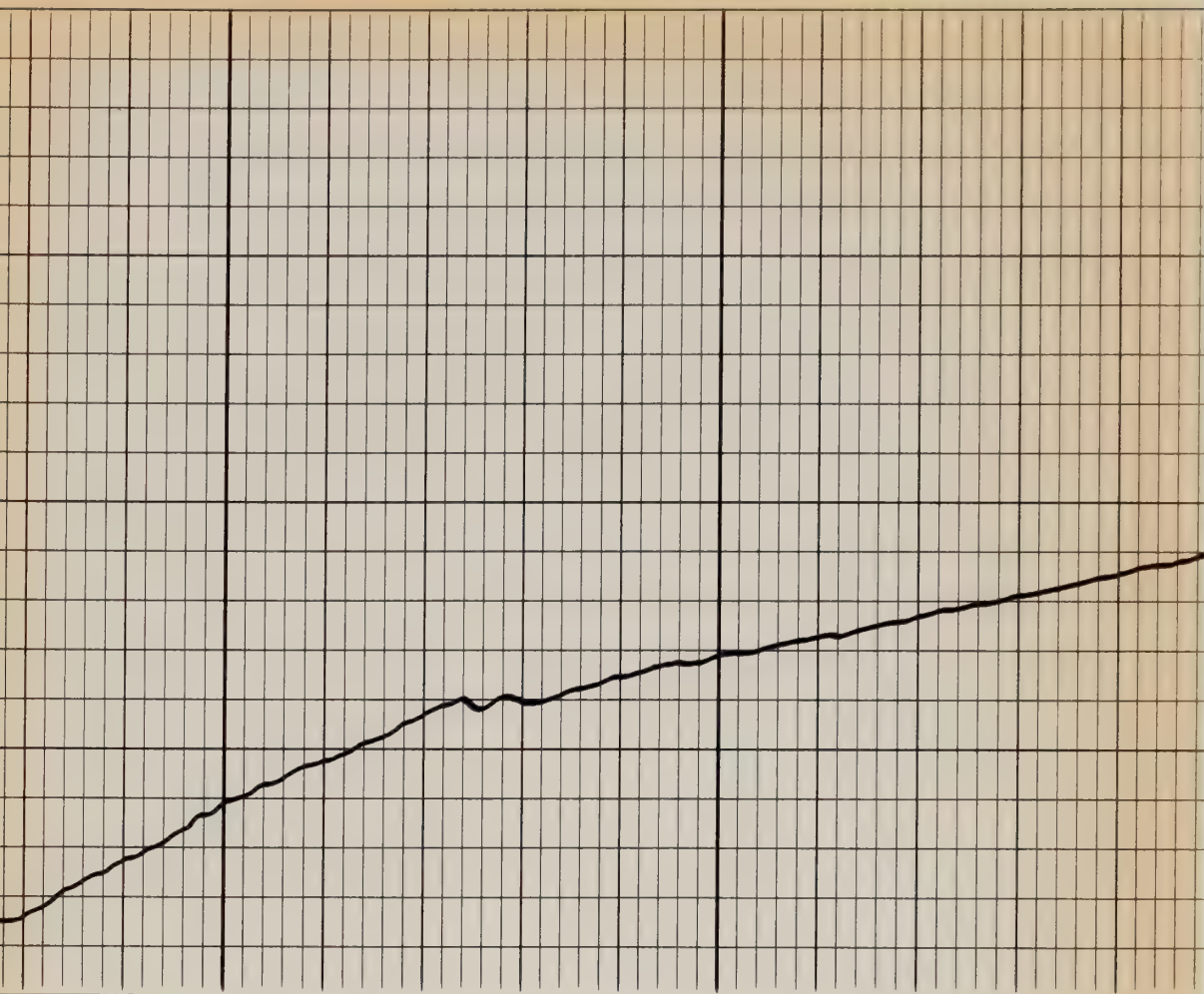
0100

Elev:



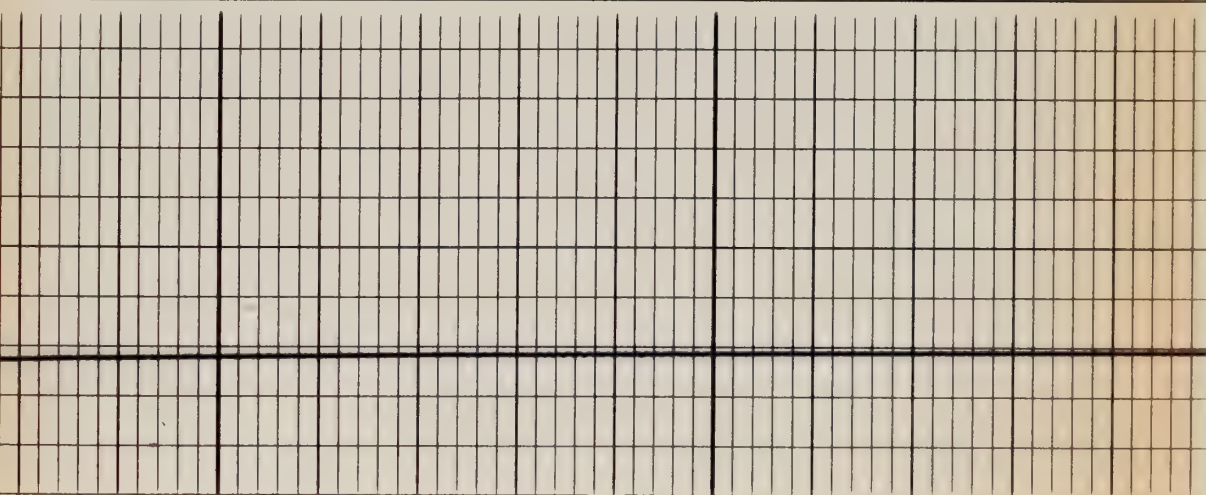
0200



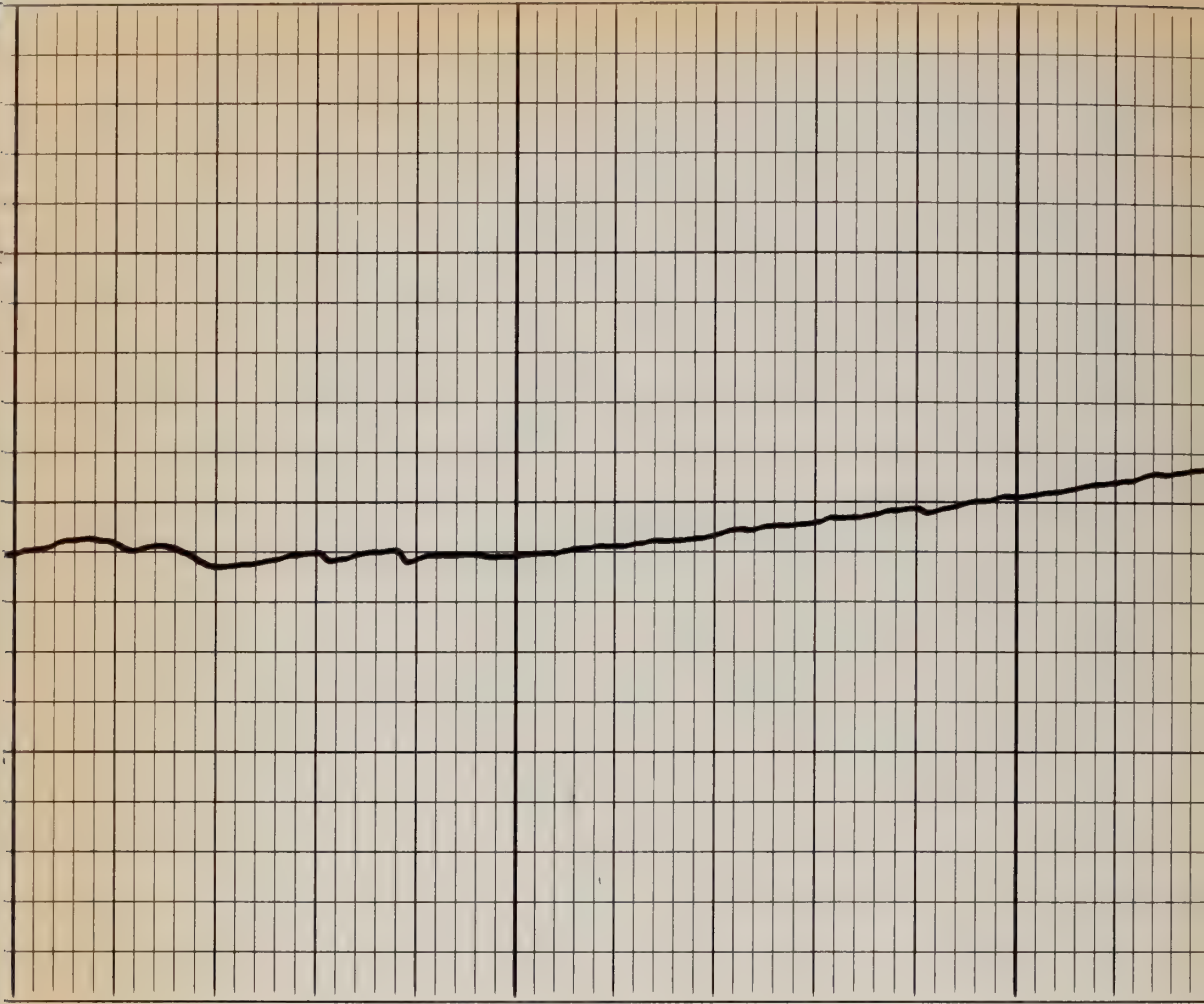


0300

04

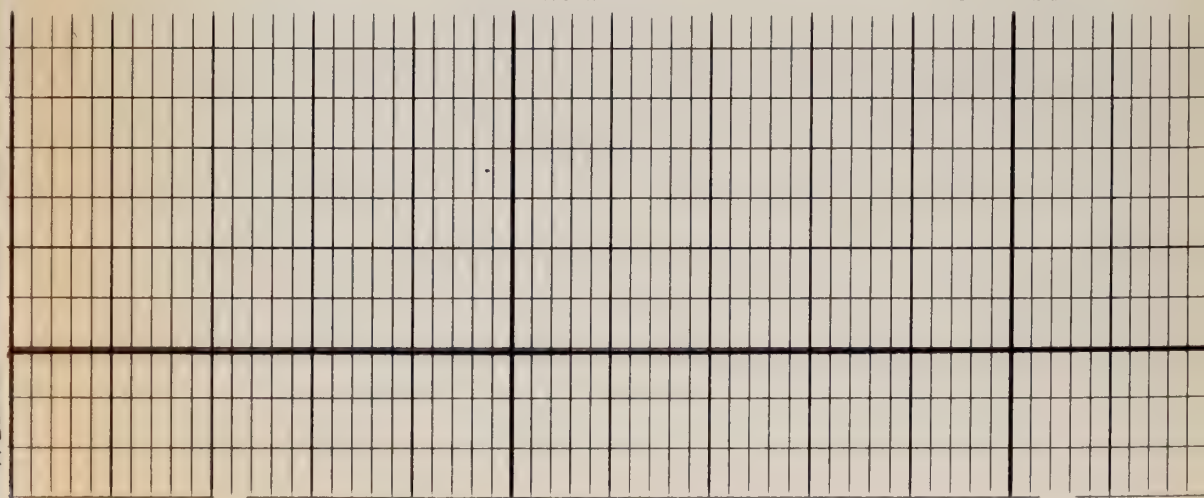


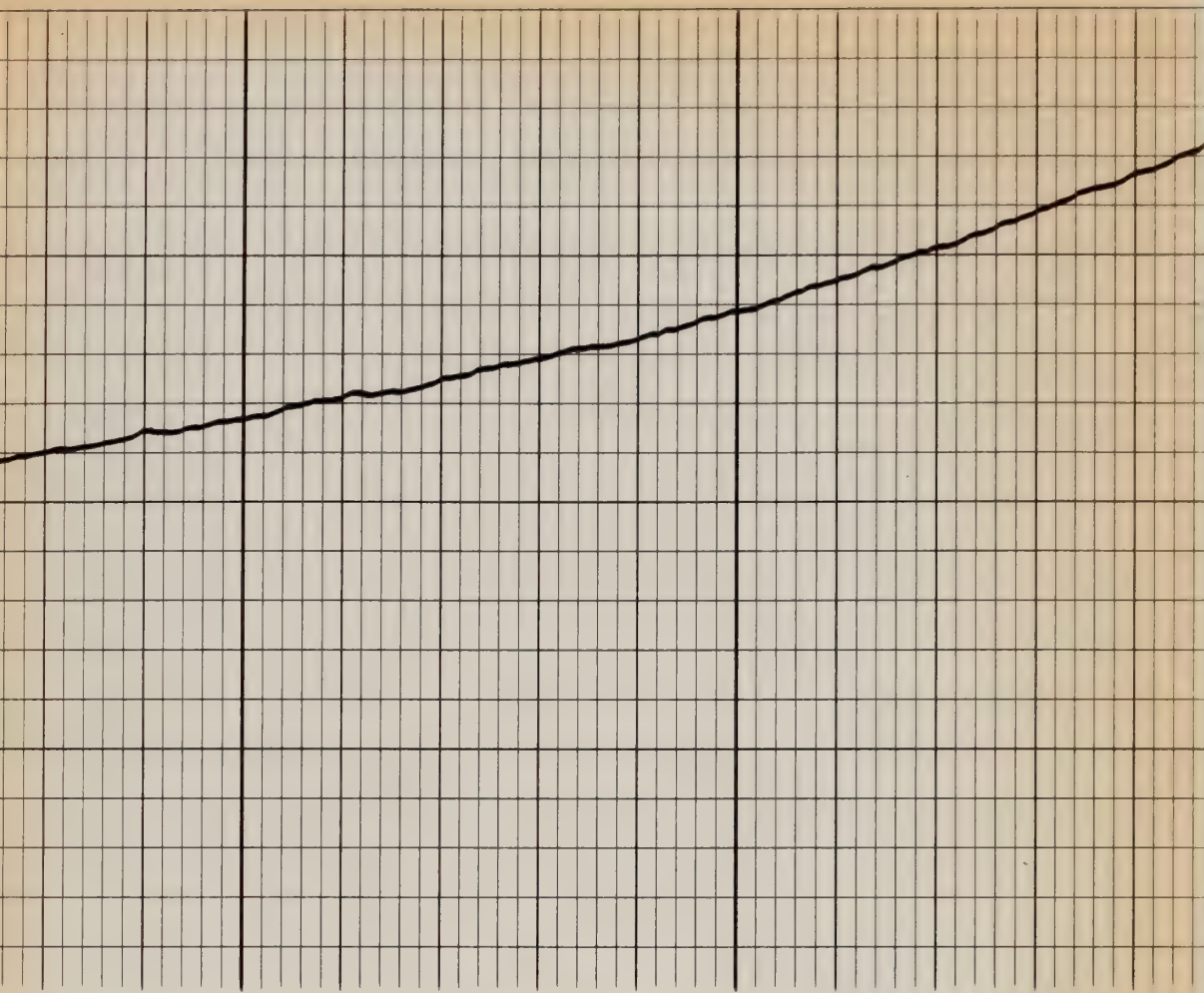
Elev: \sqrt{p}



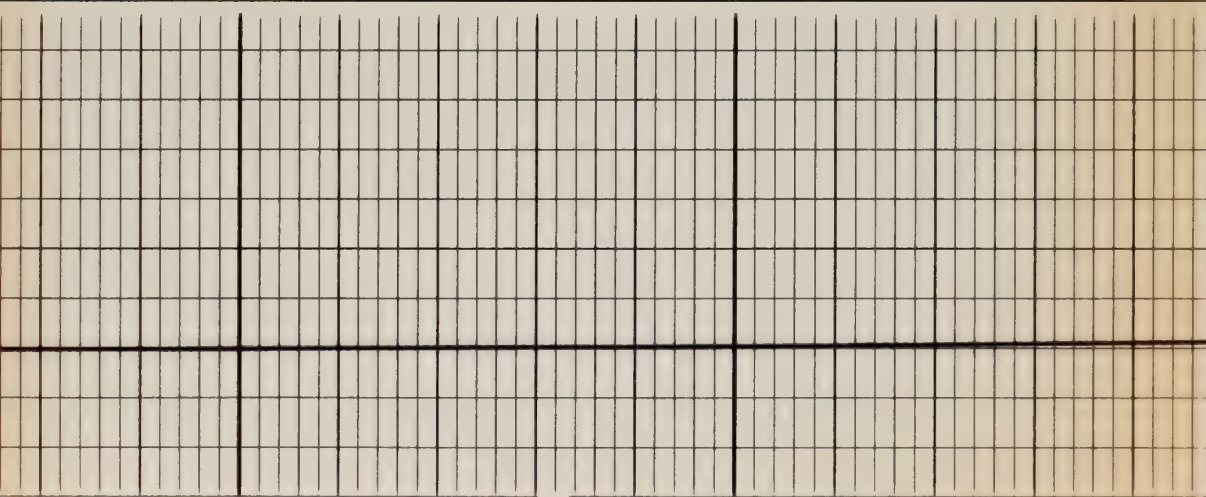
.00

.0500

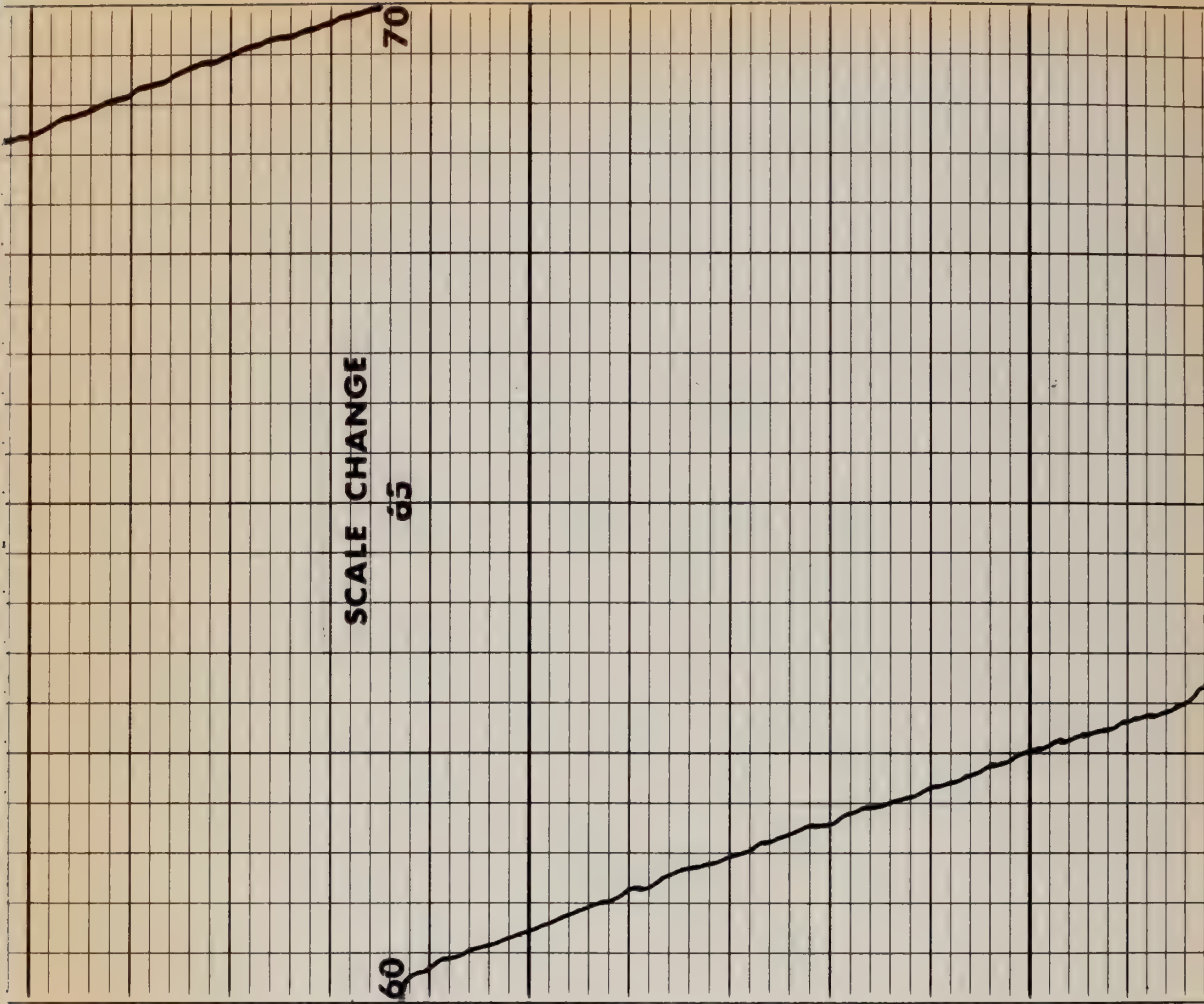




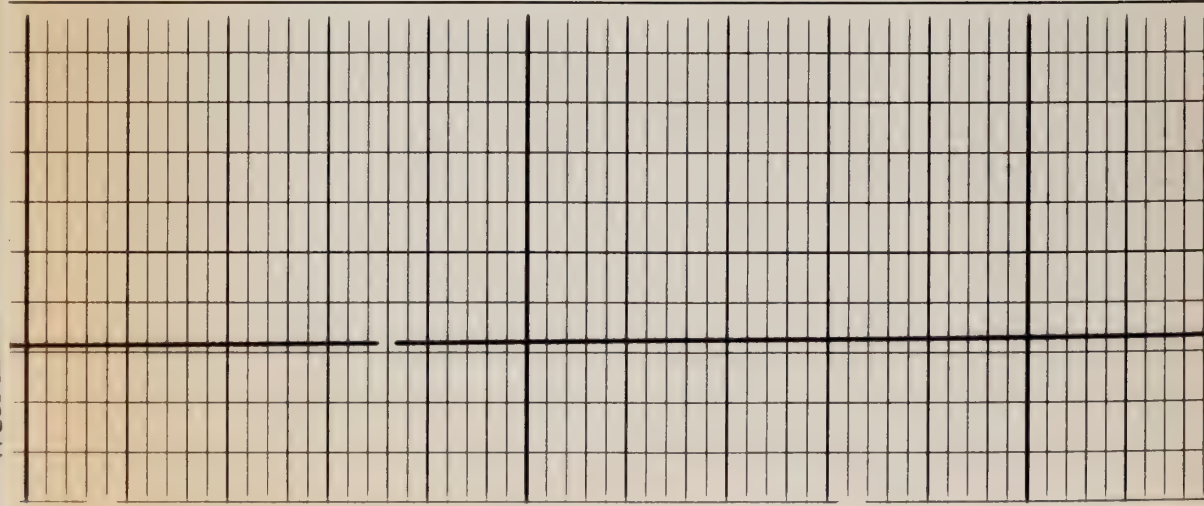
0600

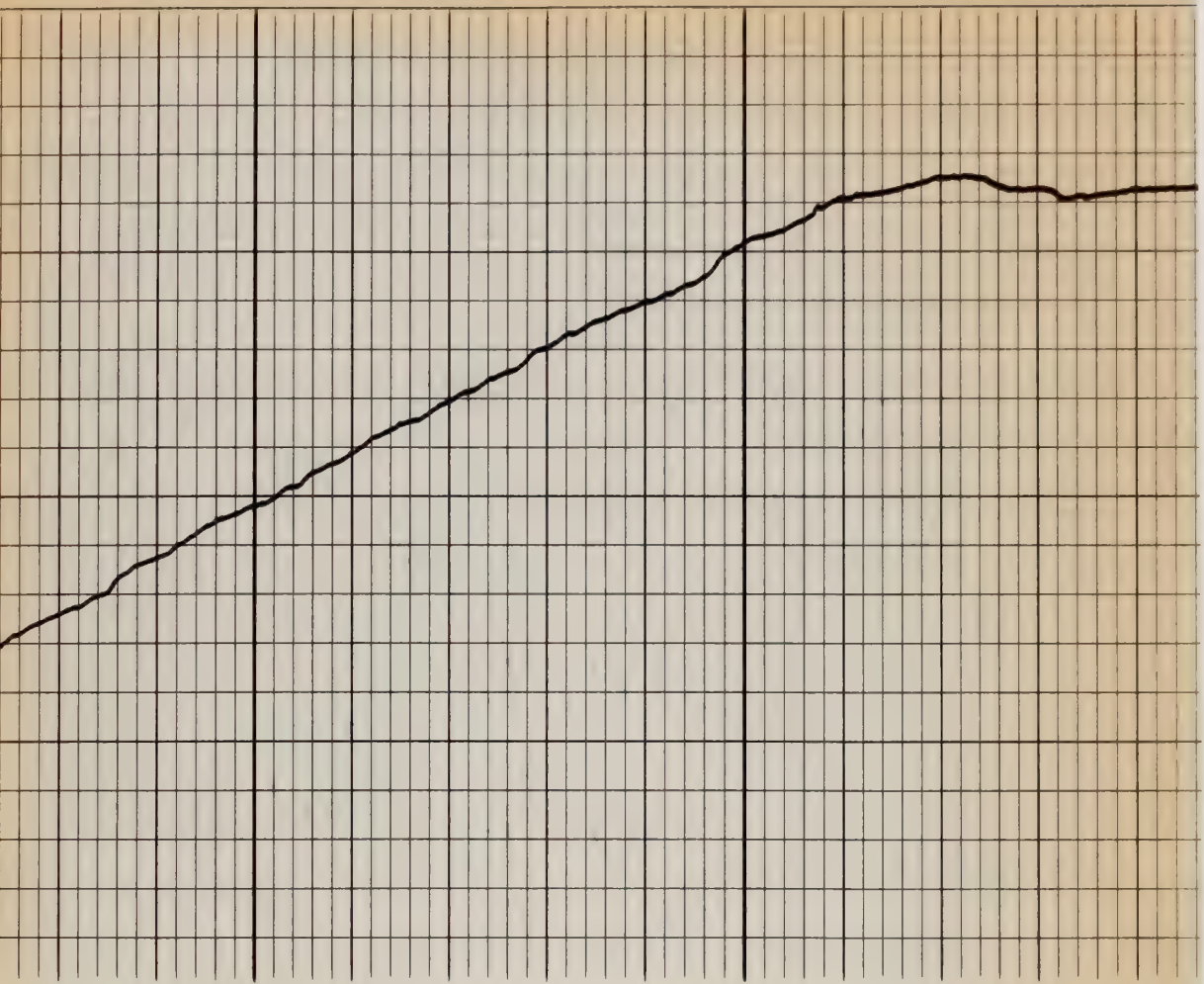


Elev: v_D

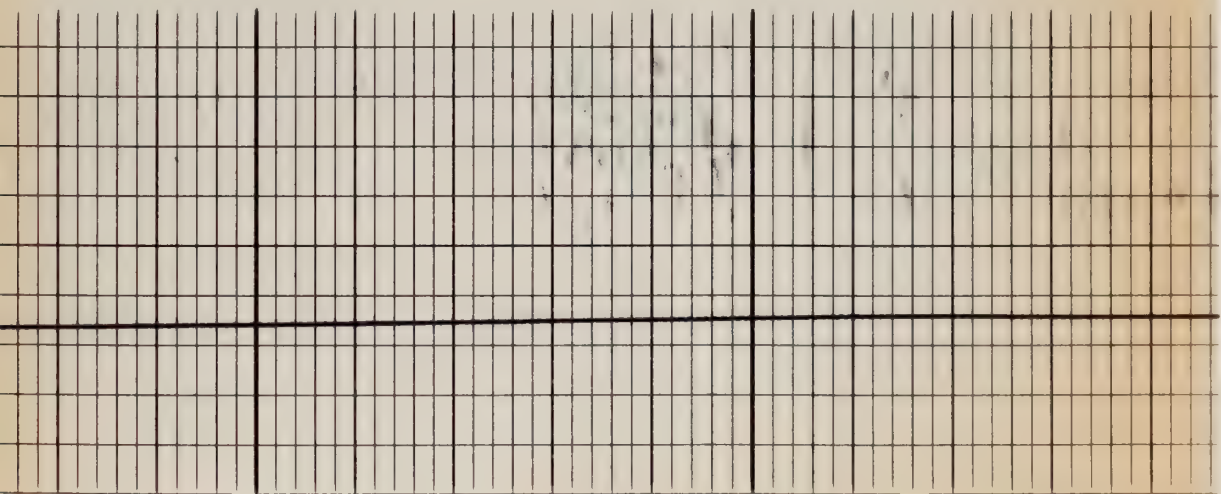


0700

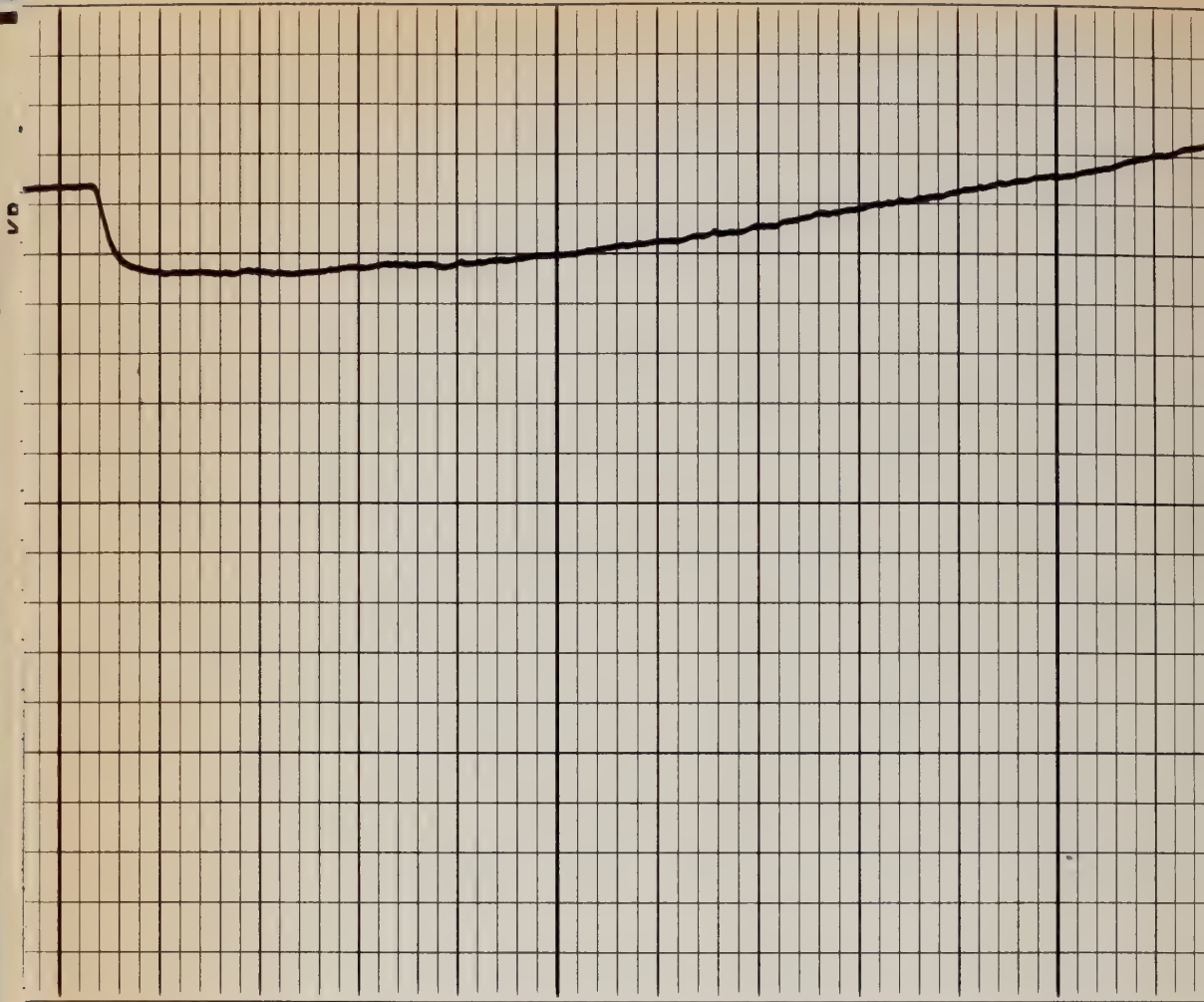




0800

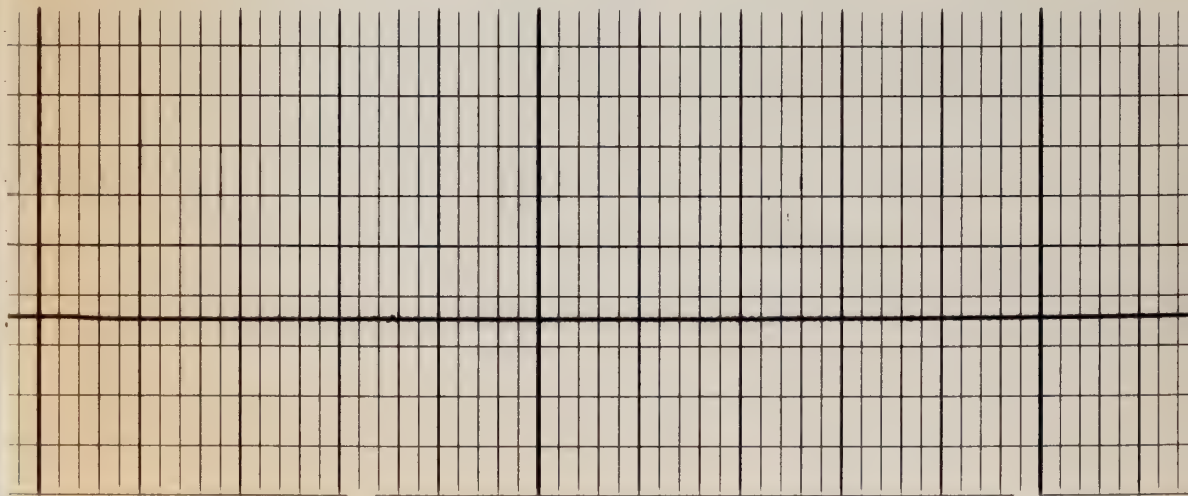


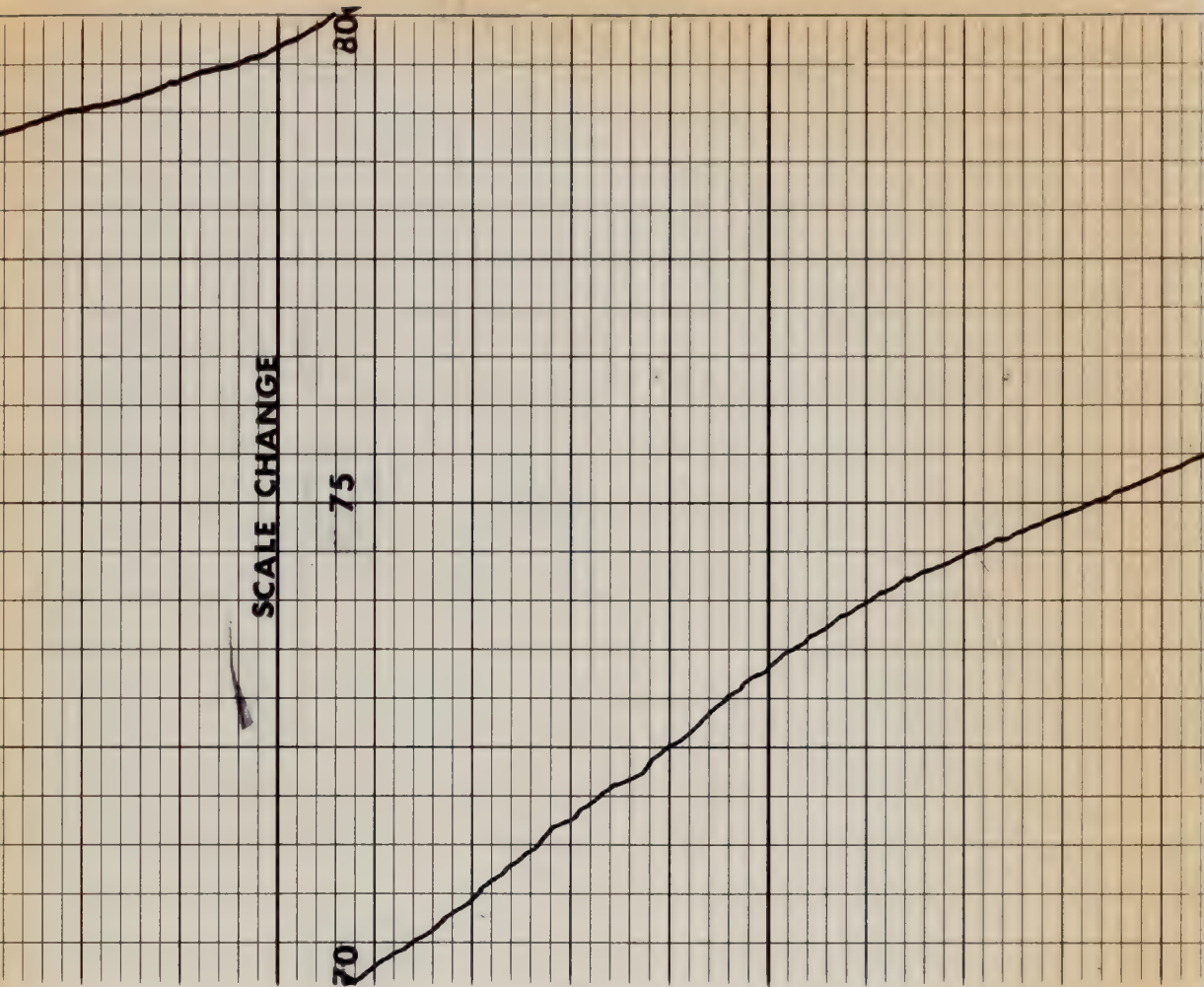
Elev:



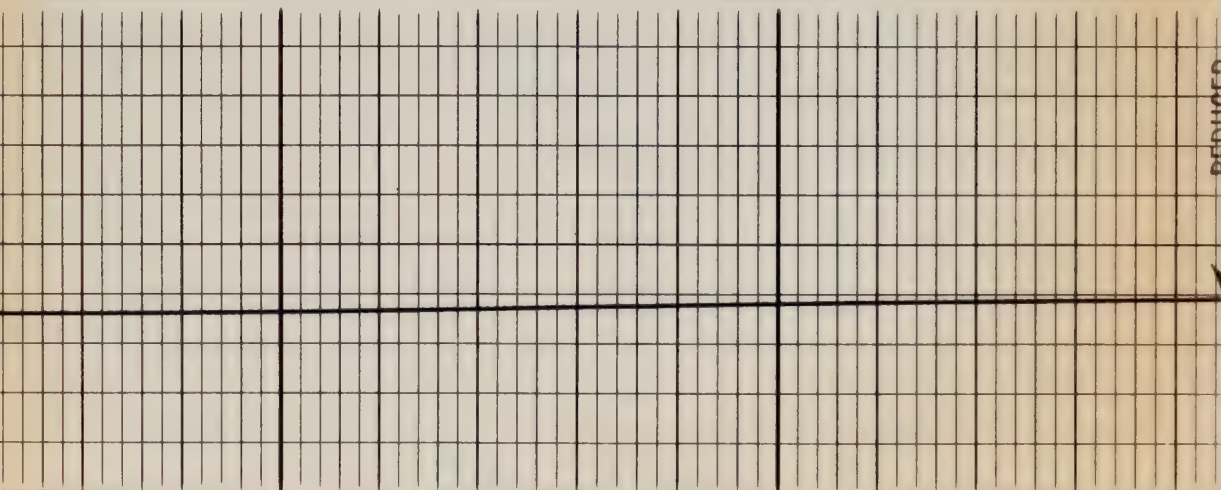
0900

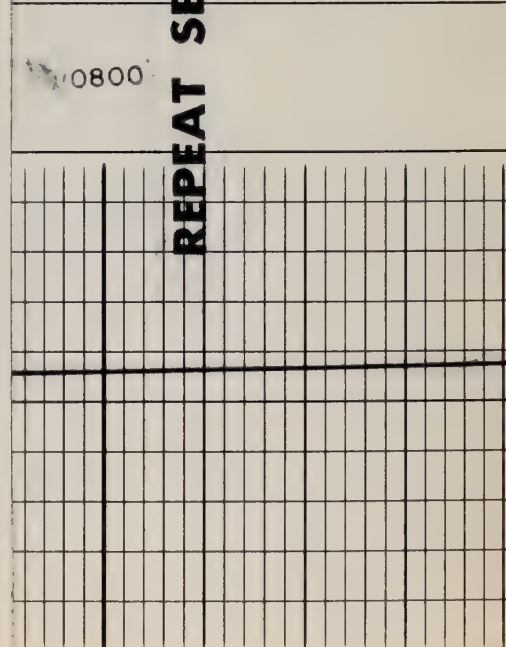
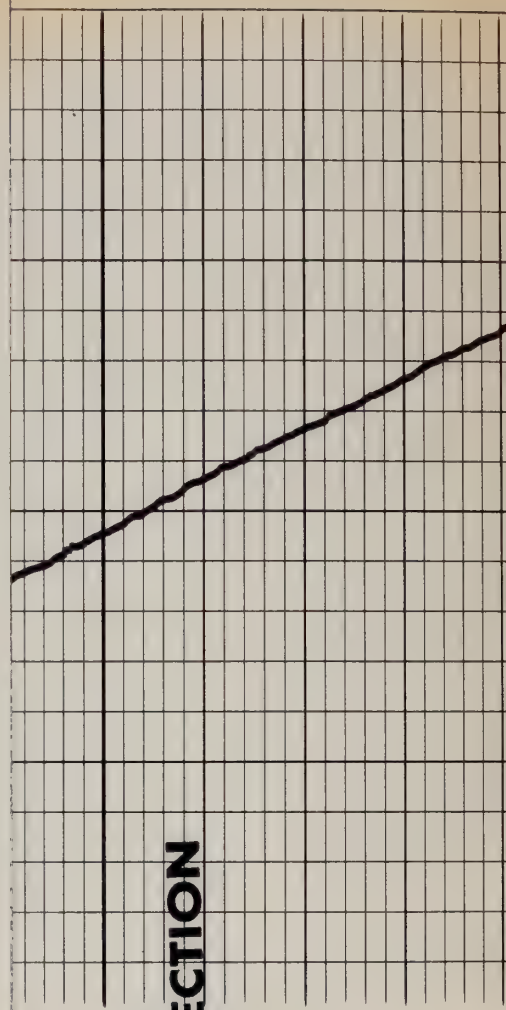
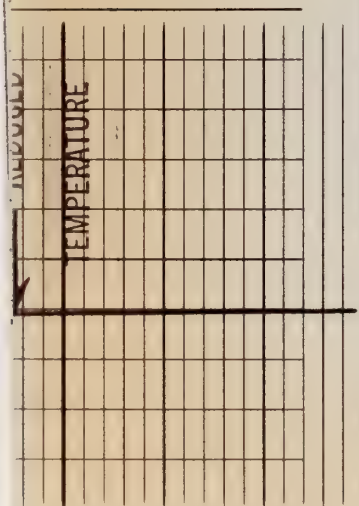
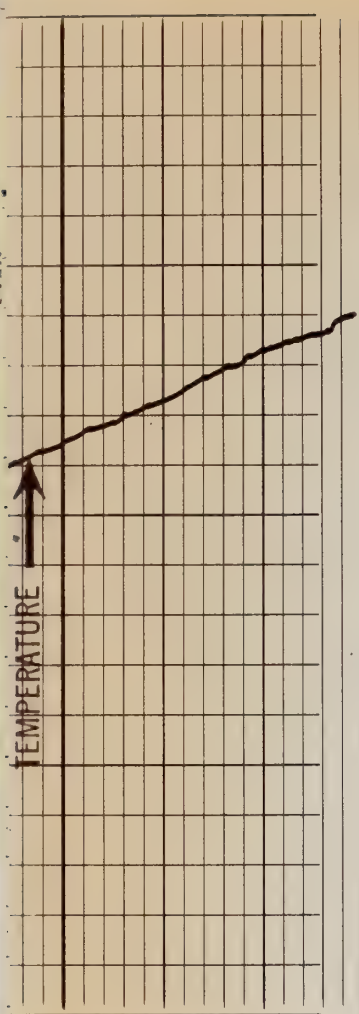
1000





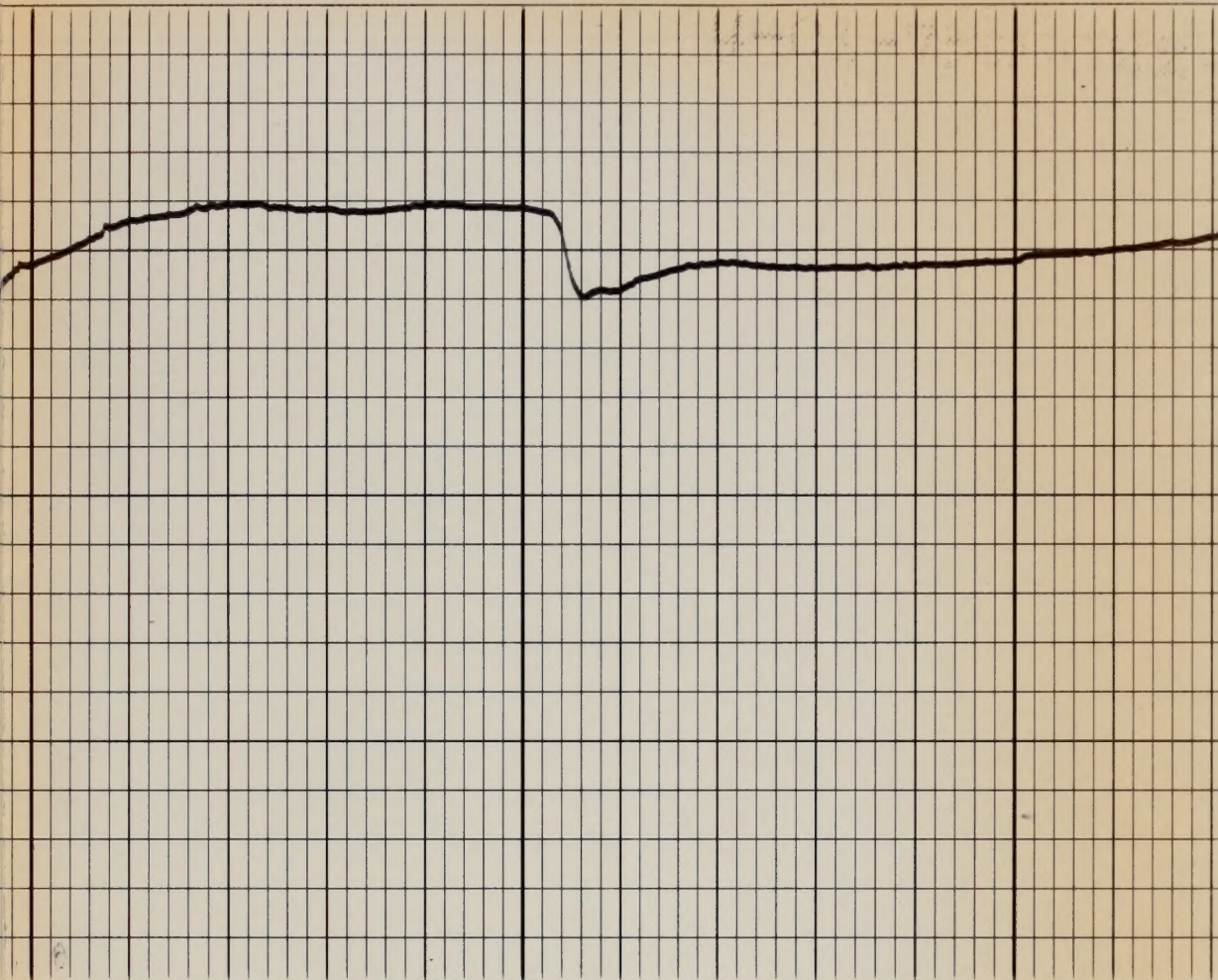
1100



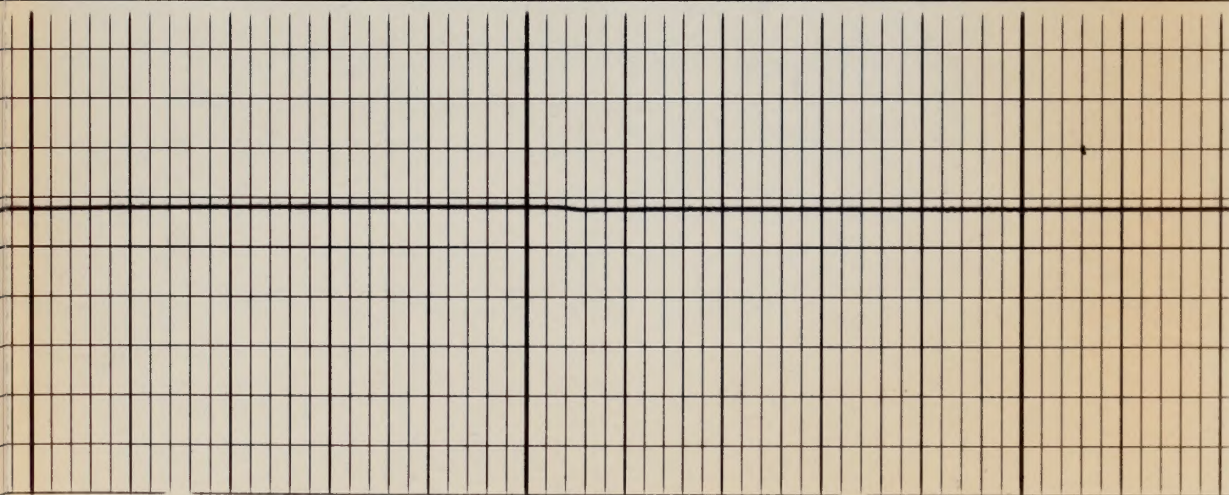


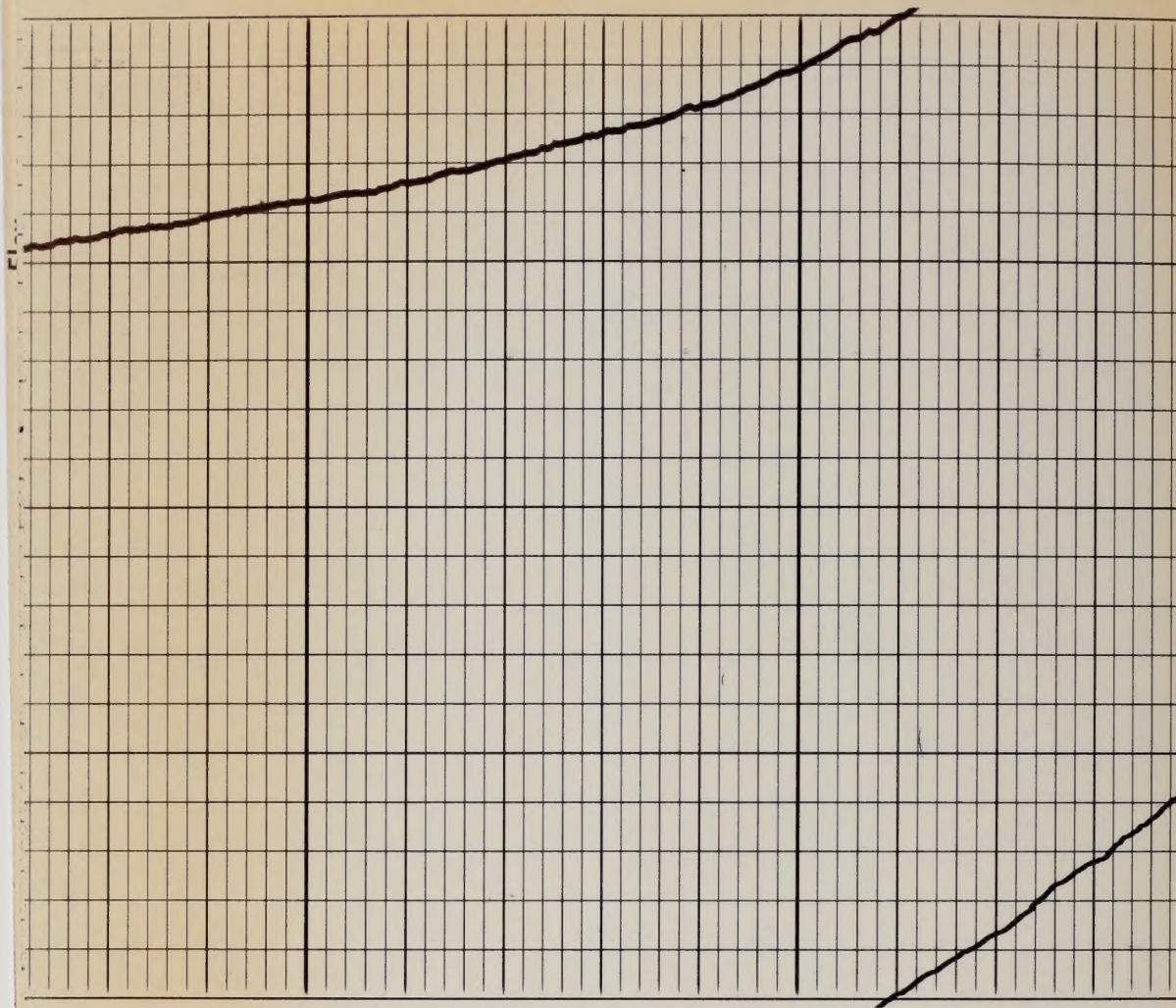
0800

REPEAT SECTION

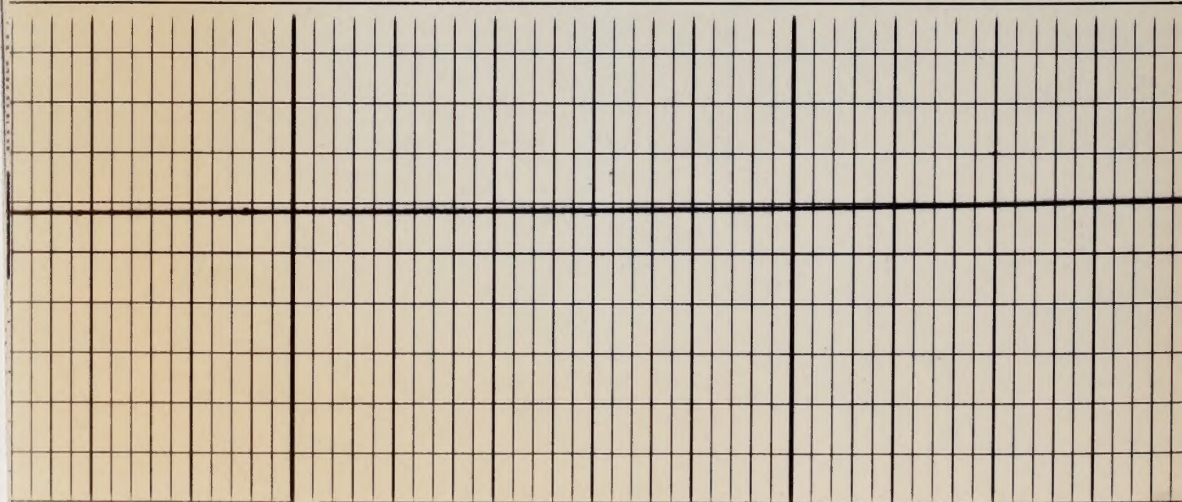


0900

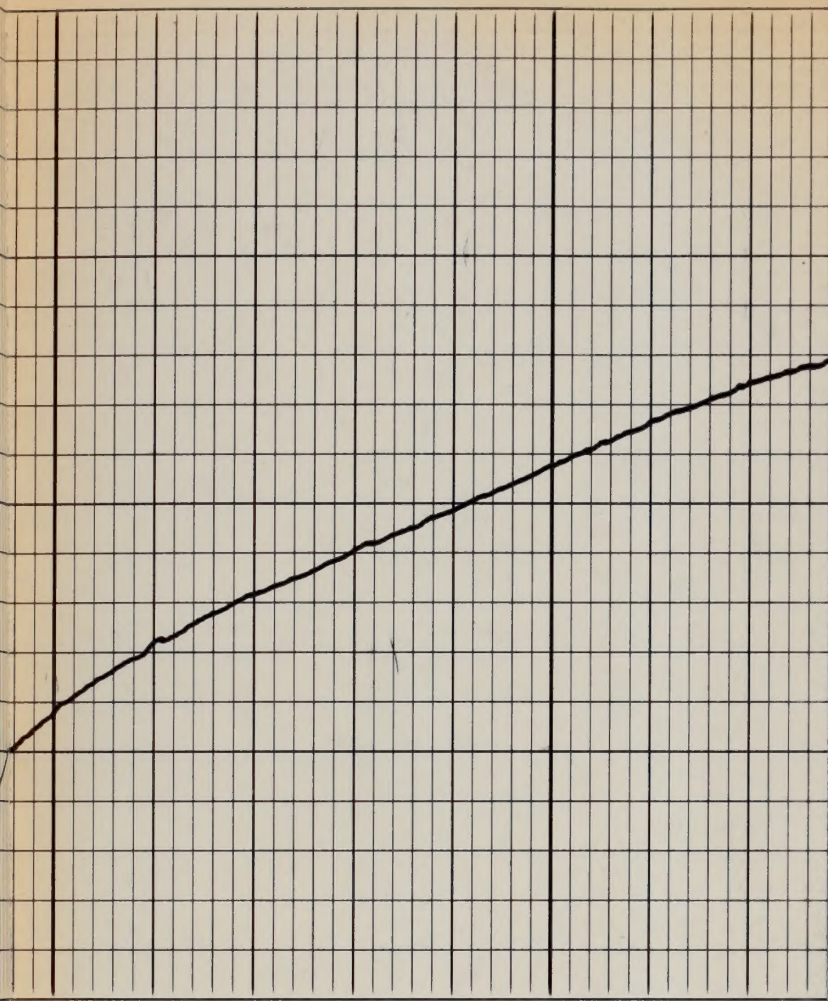




1000



1100



70

80

TEMPERATURE °F.

COMPANY ATLANTIC RICHFIELD COMPANY

WELL SORGHUM GULCH 1-A

CADDOHULL GULCH

SCHL. F. R. 1180

SCHL. T. D. 1180

DRLR. T. D. 1180

ELAB.

FIELD _____
SURNAME GULON

FIELD

COUNTY RIO BLANCO

COUNTY

STATE COLORADO